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THIS IS A COLLECTION OF ESSAYS PRODUCED BY MEMBERS OF AN INTERDISCIPLINARY SEMINAR REPRESENTING THE VARIOUS BEHAVIORAL SCIENCES. THE GROUP WAS GIVEN THE ASSIGNMENT OF CONCEPTUALIZING THE INFLUENCES OF MASS MEDIA UPON EDUCATION AS A SOCIAL INSTITUTION. THE SEMINAR WAS OF A YEAR'S DURATION AND WAS HELD AT THE UNIVERSITY OF MISSOURI. THE GROUP, IN ADDITION TO THE INDIVIDUAL ESSAYS, PRODUCED A SERIES OF PROPOSITIONS THAT MIGHT BE PUT TO EXPERIMENTAL TEST. THESE PAPERS WERE PREPARED TO STIMULATE RESEARCH INTO THE EFFECTS OF MASS MEDIA UPON EDUCATIONAL THEORY AND PRACTICE. (JK)

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Bruce J. Biddle, Raymond S. Adams, Paul F. Green, Fred E. Katz,
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PREFACE

This volume consists of a series of essays about education. These essays concern themselves with a wide range of educational problems and illustrate an even wider range of concepts for thinking about education. They were generated during a year-long seminar in which anthropologists, sociologists, and social psychologists jointly explored ways of thinking systematically about the social systems of education.

Formally, the volume represents a Final Report to the Educational Media Branch, Office of Education, Department of Health, Education, and Welfare, who sponsored the seminar at the University of Missouri (Research Contract Number 2-20-004). Support of the seminar represented a departure from the bulk of research programs contracted by the Educational Media Branch. Rather than examining the direct impact of new educational media on pupils, the seminar was given the task of conceptualizing those "other" aspects and processes in education which might be effected by changes in communications media. In attempting to solve this problem the seminar found itself wrestling again and again with "the nature of education." Education may be viewed as an institution within society, as an organization, in economic, political, or moral terms, as a focus of interaction within classroom groups, and as an arena in which individuals learn. Such perspectives suggest a wide range of variables that might be examined in assessing the impact of educational media. Thus, one of the tasks of the seminar was that of assessing the potential of each perspective (and variable) for the sudy of educational media impact.

A second task was that of integration. Social sciences of the present day offer too many examples of concepts that are either fuzzy or have different meanings depending on context. Warm and meaty words -- such as culture, function, institution, goal, or role -- have different meanings within anthropology than they have within psychology, and often nearly as many meanings within a given discipline as there are speakers who use them. Seminar participants were constantly faced with problems inherent in communicating to others with different disciplinary training. And from their joint experiences arose a number of agreements about usage and meaning, agreements that were writtent into the final forms of the essays.

Finally, seminar participants were also asked to consider programs of empirical research that might test propositions put forth in the course of the seminar. Thus, it will be noted that each of the essays presents one or more propositions about educational matters. These propositions are capable of empirical test, and in the majority of cases members of the seminar have programs of research now in process for their testing. Later reports of these research programs will present results of our efforts.

Although disciplinary titles are somewhat misleading, it might be wise to identify the training and prejudices of authors once.

The first chapter of the volume is a short, integrative essay by the editor who is a social psychologist. Chapter II, by Wilson, presents an anthropological approach to the evolution of education. In Chapter III, Green, an historical sociologist, states an antithesis to Wilson's thesis. Chapters IV and V are more sociological in orientation. In Chapter IV, Katz discusses the organization of the school and the concept of autonomy. Chapter V, by Adams, is concerned with the classroom as an integrated social system. The last three chapters are written from a social psychological perspective. In Chapter VI, Rosenblatt discusses the effects of classroom solidarity on participants. Chapter VII, by Biddle, Fraser, and Jellison, considers the relationship between teacher role concepts and teacher behavior. In the final chapter, VIII, Videbeck takes up the problem of norm learning in pupils.

Apart from those persons appearing as authors of the papers, we owe thanks for seminar participation to Henry Bates, William S. Bennett, Jr., Daniel Hays, and Edward Tomich. Visitors to the seminar during its existence included Michael Banton, Roger Barker, Ned Flanders, C. Wayne Gordon, Paul V. Gump, Jacob S. Kounin, and Marion J. Levy, whose influences may be noted in what follows. Our special thanks go to Jack Edling (formerly) and Thomas Clemens (presently) of the Educational Media Branch for their guidance and patience in supporting the seminar. Various persons helped in the preparation of the manuscript, but the bulk of the task fell on the capable shoulders of Judy Brown, Audrey Corcoran, and Charlyn Law.

B. J. B.

Columbia, Missouri
December, 1965.

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CHAPTER I

SOCIAL SYSTEMS IN EDUCATION

Bruce J. Biddle

Conceptualizing education seems at first to be a straightforward process. Everyone knows what education is. The term, education, is a collective noun having reference to the school on the corner and the university in the next town. Moreover, teachers are well known and are identified both by themselves and by others. And from our childhood experiences we are well aware that being "in school" is distinctly different from other kinds of experiences and that educational behavior is easily discriminated from baseball games, dinner time, romance, or the theatre. Why then should we be concerned about conceptualizing education; in what ways is education other than obvious?

There are several reasons for concern with the concepts of education. In the first place, contemporary education is a vast and complex affair involving intrusions into many walks of life. The typical primary or secondary school has a population numbering at least into the hundreds and including pupils, teachers, educational supervisors, educational administrators, secretaries, janitors, health personnel, and other specialists. It is housed in a complex building that must be constructed, maintained, and adjusted. Moreover, the school serves not only its indigenous population but also others in the community including parents, school board members, those who sell school supplies, and those who take pride in the school athletic teams or attend school concerts or plays. If we turn away from the primary or secondary school, the picture of education becomes even more complex. The university not only trains but also conducts research, maintains library facilities, solves community problems, provides public television or radio facilities, promotes local industries, and intrudes into the community in many other ways. And beyond the walls of the public educational institution may be found literally thousands of private (both religious and non-denominational), industrial, military, trades, technical, re-training, language, continuing, extension, evening, adult, and a hundred other kinds of schools. Taken together, education represents the largest single institution in contemporary society, and it is difficult to imagine the operation of any community, organization, institution, or society without also envisaging an educational concommitant.

Another difficulty with the educational institution is its fuzzy boundaries. It is clear that what goes on in the public school classroom is education, and that the teacher and pupil are members of the educational cast. But is the book salesman who services the school also involved in education, or the contractor who lays the pavement outside the schoolhouse door? What about the quasi-educational institution such as the "diploma mill"; is it a part of education? Is education taking place when school-age children watch "Mr. Wizard" on their television sets -- or when their parents turn out for a university football game?

Beyond such questions, we should also be aware that the forms of education differ from society to society and, indeed, have changed rapidly within our own society particularly during the twentieth century. In some of the most primitive societies little or no formal education may take place. In others, education may be performed only on certain occasions and then by any adult who happens to be present. Still other countries conduct education for only selected youths or consider the transmission of knowledge a secret or privileged matter. In still other societies schools may be conducted wholly by the state, the church, or the military. Clearly, the forms of education in a society reflect a multitude of factors, the available resources and technology, the values of the culture, the availability of supporting institutions, the training given to teachers; and clearly, too, education plays a part in maintaining the other institutions of a society and in promoting, or hindering, social change.

Conceptualizing education, thus, is a complex task requiring insight from various social sciences and elsewhere. And it should not be too surprising to discover that there are various ways in which education may fruitfully be conceived. This does not mean that concepts for education constitute an unassimilable hodgepodge. On the contrary, as the essays which follow will demonstrate, there is a convenient order to concepts about education. As will be seen, it is possible to think about education in grand terms, at the level of the largest social groups, in terms of societies and their institutions. It is also possible to think of somewhat smaller educational units, or the organizations that make up education, of schools and school systems. It is also possible to conceive education in terms of the face-to-face interactions in which education is performed, and particularly in terms of the classroom. And finally, education may be thought of as it impinges on the major participants in the educational process -- the teacher and the pupil. At each of these levels -- society, institution, organization, classroom, individual -- certain concepts come to the forefront of the analysis. As we shall see, there is some similarity among the concepts used at each level of educational analysis; but there is also good reason to believe that some of the concepts used are more appropriate to their particular level and would be awkward if used at another level of analysis.

In the next section of this chapter we consider each of these levels of analysis and the concepts used for the analysis of education at each level within the essays that follow. In the process of developing concepts, the theses of each essay are briefly summarized. Finally, we consider the implications of the general model for the problem of examining the impact of new educational media.

Social Systems and Their Concepts

In the essays that follow, five types of social systems are conceptualized -- societies, institutions, organizations, classrooms, and individuals. In this section an attempt is made to discuss each social system and the concepts used for that system to discuss education.

Society

As conceived here, a society consists of the largest set of persons who share a common culture. In primitive societies, bounded by those traditions that can be passed on from one generation to another and which may be integrated by word-of-mouth and shared ceremony, a society may consist of but a single village. In modern civilizations, however, a society cuts across many locality boundaries and may, for some purposes, be considered in national or super-national terms.

Societies may be considered as either analytic or concrete units. For analytic purposes, the boundaries of a society occur when there are significant changes in culture. The fact that one must look at elements of culture to separate one society from another suggests that, depending on those elements chosen for analysis, one may find smaller or larger units defined as societies. When looking at education, for instance, an analytically defined society becomes a unit of people who share an educational institution in common. Societies may also, however, be defined concretely -- in terms of the identifications shared by their members or outsiders. Americans often consider themselves but a single society despite the obvious differences in culture among the various regions of the country.

In part, the usefulness of the concept of a society depends on coincidence between its analytically and concretely defined boundaries. When customs, language, and institutions are demonstrably different between areas that are also conceptualized independently by their members, these separate groups of people may easily be reified into analytic units. If these conditions are not met, the concept of a society becomes less viable. We shall find similar problems of analytic and concrete definitions for social systems appearing at other levels of the discussion.

Culture. As suggested by Wilson (Chapter II), culture should be considered as at least three orders of phenomena that are shared within a society: (a) objects (or technology), (b) acts (or social behavior), and (c) ideas (or ideology). Wilson also reminds us that cultures are superorganic (therefore a distinct order of phenomena analytically separable from the biological factors of man), are transmitted from one generation to the next by symbolic behavior, are cumulative, and are an adaptive mechanism that enables societies to adjust to their environments.

If cultures consist of shared objects, ideas, and social behavior, it is reasonable to ask whether any of these realms tends to determine the others. Are ideas reflected in behavior, for instance, or are ideas mainly a rationalization for behaviors that are independently carried out? Wilson suggests that the technology of a society should be regarded as the major independent variable -- determining, at least in part, the forms of social behavior and ideology that appear. His argument is that technology provides but a limited set of behavioral and ideational alternatives, and that it is difficult for any society to transcend its technological base. This contention is questioned by Green (Chapter III) on two grounds. On the one hand, Green argues that technology alone is insufficient to determine the other constituents of culture and that it is also necessary to know the type of physical environment in which a society is based. Green also argues that certain aspects of social behavior and ideology -- particularly those associated with education -- operate as feed-back mechanisms and constrain or facilitate the development of technology. The question of the potential for a technological change determining other aspects of culture is of significance in understanding the potential impact of new educational media and is taken up again in the last section of the chapter.

Evolution. Both Wilson and Green make use of the concept of evolution in discussing the differences among cultures. As suggested by Wilson, evolutionary studies are those which state temporal generalities for the class of phenomena with which they are concerned and which ignore differences among the exemplars at each stage. Thus, the evolutionary study of societies is a study of the ideal stages of societal development without regard for differences among societies within a given stage.

It is possible, of course, to consider the evolution of other types of social systems, the evolution of the institution of education for instance, or of educational organizations or the classroom. Evolutionary studies of the physical characteristics of man or of physical equipments of all kinds are well known. It is interesting to note, however, that none of the other social systems appearing in this volume have been treated from an evolutionary perspective. It seems likely that this hiatus represents a general posture within contemporary social science -- the acceptance of a common anthropological (and sociological) claim that the forms of institutions and other, smaller social systems are determined by their enfolding cultures. If one assumes that education, for instance, reflects primarily the general stage of development of the society in which it is imbedded (as is argued by Wilson and Green) then it is far more reasonable to study the evolution of society than that of education itself. That this is a questionable assumption is clear, however. It is also possible that smaller social systems may develop their own cultures, may socialize prospective members, and may evolve. Indeed, the evolution of institutional or organizational forms may have an influence on the societies that enfold them. It seems likely that evolutionary concepts will prove useful for the study of smaller social systems in the near future.

Societal Types. Within an evolutionary perspective it is necessary to conceptualize cultural types that represent stages in the idealized developmental sequence through which societies pass. Following Beardsley et al (1956), Wilson suggests seven different cultural types -- based on patterns of residence. In the proposed sequence these are: I - Restricted wandering, II - Central-based wandering, III - Semi-sedentary, IV - Simple nuclear centered, V - Advanced nuclear centered, VI - Simple, supra-nuclear integrated, and VII - Advanced supra-nuclear integrated. It is argued in

Wilson that these evolutionary stages depend upon the unique utilization of technology and that a distinctive typology of education appears in each stage of development.

Arguing that a cultural typology based on patterns of residence is inappropriate for the study of education, Green advocates that cultures be classified in terms of (a) their environmental potentials and (b) their technologies. Following Meggers (1954) he classifies environments into those of: A - No agricultural potential, B - Limited agricultural potential, C - Unlimited agricultural potential, and D - Improvable agricultural potential. This classification then interacts with seven distinct and stable stages of technology to produce a more complex typology of cultures. The discussion by Green focuses on variations produced in settlement patterns, ideology, socio-political structure, and education. Whether the classification used by Wilson or that of Green is a more useful one may be determined by empirical means.

The Institution of Education

The fact that societies are here classified in cultural terms -- rather than being separated into analytic components -- reflects the task assumed by the authors of Chapters II and III. The concept of society is an inclusive one which subsumes education -- and other things. The argument in both Chapters II and III is that the form of education is (at least in part) determined by cultural processes operating within society. It is appropriate, therefore, that the major institution dealt with in detail in these chapters is that of education itself.

For our purposes, an institution may be considered an organized form of social behavior that is regularly performed by selected persons within a society. Examples of institutions include those of education, commerce, industry, the family, transportation, recreation, humor, and the pursuit of happiness. One way of thinking about the behavioral aspects of a culture is to separate it analytically into its institutions. It is also useful to recognize that most institutions also involve a characteristic technology, ideology, and spacial or temporal location for their performance.

Like societies, institutions may be defined in either analytic or concrete terms. For instance, it is possible to distinguish, analytically, between magic and religion although the members of a given society may not make such a distinction in their language. As was pointed out for societies, however, it is usually more convenient to define institutions in terms of shared awareness of the institution by members of the society. Usually, but not necessarily, such a definition is given in purposive terms. Thus, Wilson defines education as -- "everything that happens to an individual involving social interaction where at least one actor has as his purpose the instruction of at least one other actor." This definition differentiates education, on the one hand, from more inclusive processes such as socialization; and, on the other, from sub-institutions such as informal and formal, or private and public, education.

It is also possible to construct a typology of educational institutions, and Wilson suggests such a typology in order to relate educational forms to societal evolution. Wilson's typology is clearly based on the definition of education he gives. Thus, educational institutions differ in: (1) Who is taught -- some individuals versus all individuals, (2) Who teaches -- someone who is recognized as a "teacher" versus someone who is not so recognized, and (3) The purpose of education -- to equip the individual to occupy a specific position in his society or to occupy a general position in society. That these distinctions do not exhaust the various forms of education visible in (the contemporary) world is clear. However, Wilson argues strongly -- as does Green -- that such a typology clearly reflects the evolutionary stages of cultural development.

As one aspect of culture, it should be recognized that education also has its technological and ideological concommitants. When we think of schools, we are not only aware of the usual behaviors of teachers, administrators, and pupils, but we also tend to think of the characteristic buildings within which education is performed and of the equipment therein, and of the typical beliefs, values, and norms with which education is discussed and justified in our society. It is interesting to note that although both Wilson and Green argue for the primacy of technology in determining other aspects of culture at the societal level, neither author argues for the primacy of educational technology in determining educational behavior or ideology. What happens to the institution of education, for instance, when literacy is introduced, or printing, or educational television, or the teaching machine? We shall return to this interesting question in the final section of the chapter.

Structure and Function. The concept of social structure is that of a persistent framework, pattern, or mode with which social behavior is carried out. Societies are structured if their labor is divided and allocated to certain persons and not to all, if persons are known by titles that distinguish them from others, when behaviors vary as a function of time of the day or month or year. Structured behavior may, of course, be observed within societies, institutions, organizations, or smaller social systems.

Structure is often contrasted with function. If structure consists of the persisting patterns or modes with which social behavior is carried out, function is that which is produced by structure; the ends or states-of-affairs which are produced through patterned social interaction. Education, typically, produces significant changes in the beliefs, attitudes, and behaviors of young people who are subjected to it; thus one of the functions of education is that of socializing the young. Other functions that may be observed for education include those of recreation, baby sitting, the maintenance of certain economic institutions, the focusing of some political action, the integration of small communities, and many others.

As used by most social scientists, structure and function are analytic and not concrete concepts. Thus, as many structures may be recognized (and as many functions) as the fecund mind of the social analyst may conceive. To say, for instance, that education has the function of baby sitting does not necessarily imply that this function would be concretely recognized as a goal by parents, educators, or pupils of the community. Indeed, the recognition of functions has led Robert Merton to suggest a distinction between manifest (recognized) and latent (non-recognized) functions. Similarly, some forms of regularized social behavior may be strongly supported through shared ideology while others may appear through happenstance, convenience, or habit and may not be thought about.

Positions and Roles. One commonly recognized form of social structure is that of positional differentiation. In most societies, institutions, and smaller social forms, persons are not only known as individuals but also in terms of their joint membership in classifications for people. One is not merely a human being in the eyes of others; one is a man, an attorney, a Mason, a Presbyterian, a volunteer fireman, a teacher, a poker player, and so on. Such classifications are usually termed (social) positions, although the same concept may also be termed "status" in anthropological writings. Positional classifications consist of referential terms which are shared among the members of a social system and which pertain to groups of social actors -- hence positions are usually assumed to be concrete. In his definition of education given above, Wilson has already introduced us to two common positions to be found within the majority of educational institutions -- the teacher and the pupil. Other educational positions include those of the principal or headmaster, the superintendent, the inspector, the janitor, the health officer, the secretary, and so on.

Following a distinction made by Ralph Linton, positions are often associated with roles. The latter term refers to the set of behaviors associated with a person or position including not only the acts performed but also ideas held about his behavior by himself and others. Thus, the role of "teachers" consists not only of the patterns of behavior characteristically emitted by teachers but also of the norms, anticipations, and values held for teachers by themselves and by others. The existence of an identifiable role for a group of persons makes it far more likely that they will be singled out for identification as a position. Nevertheless, the fact that a positional classification exists does not necessarily imply a role nor must all roles be performed by positions. Role is essentially an analytic concept; position a concrete concept (see Biddle and Thomas, 1966). It should also be pointed out that the role concept is an unwieldy one for direct analysis and that most investigators in the role area pick subsections of roles for empirical study.

Educational Organization

Several characteristics distinguish the concept of organization from the somewhat broader one of institution. Perhaps the most important of these is that of rationality. Whereas institutions are patterned forms of behavior, organizations are also rationally organized. As Katz suggests (Chapter IV) in organizations, "members are chosen on the basis of ability to perform specific tasks; responsibility for accomplishing tasks is incorporated into established positions, each of which is systematically related to other positions....; responsibility and duties are 'built into' positions through a system of rules that specify the contribution of each position to the whole organization; and underlying the whole system, and providing the raison d'etre for all the roles, is the 'mission' of the organization." Thus, in organizations we must assume not only the shared recognition of a common purpose but also (a) that there is at least partial subordination of social behavior to that purpose, and (b) that the subordinated social behaviors were consciously planned and organized for their achievement of the purpose. Organizations are not only "organized"; they are also inherently instrumental. By definition, organizations are concrete social systems, although they may also have latent functions that are not recognized in the purpose or "mission" for which the organization was created.

Many types of organizations may be found in contemporary society including organizations for the pursuit of most major institutional goals. Educational organizations include schools, school systems, universities, and a variety of educational service organizations. It is common to assume that the educational institution is necessarily composed of a number of organizations. In part this reflects the definition of the concept of organization. It is difficult to organize rationally all aspects of an institution within a complex society -- as the Russian communists are presently discovering -- indeed, it is often more efficient to maintain a variety of organizations for various sectors of that institution. In part, however, this assumption reflects the unique structure of American education. In other Western societies (such as France and New Zealand) education is organized by the state, and the entire institution of education consists of but one, enormously complex organization. In America, however, schools are more autonomous and may often be considered as independent organizations in their own right. At most, the largest administrative unit incorporating most primary and secondary schools that may be considered an organization is that of the school district.

Formal and Informal Structure. Informal structures may be said to characterize societies, institutions, families, and all recognizable social systems whether organized or not. But within organizations may be found another type of structure consisting of the formal set of ideological specifications that gives coherence, permanence (and reification) to organizations. In typical organizations within Western society, for instance, there exists a Table of Organization listing the recognized positions of members, a set of norms or job descriptions governing the behavior of position occupants, a description of the purpose of the organization, procedures for the handling of grievances and discipline, regulations governing the recruitment, training, maintenance, and discharge of personnel, and so forth. Such ideological specifications for the organization are formalized not only through their effects upon the behaviors of organization members but also because they are written down and have an existence that is independent of persons. Indeed, it is difficult to conceive of the existence of formal structure -- hence of organizations -- without first presupposing literacy or some other means of storing ideology. However, in some pre-literate societies simple organizations may be observed in which joint participation in shared ritual serves to fix and formalize ideological specifications for all concerned.

Following Max Weber, most studies of organizations to date have focused on the characteristics of formal structure. A large variety of concepts pertaining to formal structure have been proposed and investigated in relationship to size of the organization, productivity, morale, and other variables of interest. As is pointed out by Katz (Chapter IV), not only has this general emphasis ignored the necessary, informal characteristics of organizations, but it is not altogether clear that the distinction between formal and informal structures is a useful one. Katz suggests that for many reasons it is absolutely necessary to structure autonomy for the organizational participant and then proceeds to develop not only a typology of autonomy types but suggests a number of propositions about the genesis and effects of autonomy within the organization. In terms of schools, it seems unlikely that the reduction of teacher autonomy through administrative regulation will ever replace the responsibility and creativity of the adequately trained teacher. Katz also suggests that autonomous structures within the school -- particularly those of the student culture -- may either facilitate or vitiate the formal purposes of the educational organization.

The Classroom

The classroom is but one type of behavioral setting found within the school. Following Roger Barker, we shall conceptualize a behavior setting to consist of the conflux of a physical environment (including both an enclosure and characteristic props) and a characteristic pattern of social behavior. Using such a definition, classrooms are one type of behavioral setting found within the school. Other school settings include the library, the lunch room, grounds and walks around the school building, the teachers' lounge, the principal's office, and so on. Although significant interaction may also take place within other school settings, it may be assumed that by far the majority of educational processes take place within the classroom context.

Classrooms share several unique characteristics not normally found in other types of common behavior settings. They have a unique physical structure typically consisting of a box-like room with little attempt to control sound, a series of desks for the participants, and a variety of familiar tools such as chalk and chalkboards, visual aids, textbooks, writing tools, and the like. In terms of formal structure, the classroom is usually inhabited by one mature teacher and thirty or more immature pupils. (It is rare to find another adult in the classroom, and when this happens it usually changes the structure of classroom interaction significantly.) Classroom participants are also constrained by purposes, procedures, regulations, and textbooks that are forced upon it through the enfolding school organization or community. In short, the classroom setting -- though ubiquotous -- bears little relationship with other common primary groups such as the family, the discussion group, or the industrial team.

Classroom Structure. Apart from formal, structural properties of the classroom -- such as the positional distinction between teacher and pupil -- a truly striking variety of informal structures may be observed within the classroom. In Chapter V, Adams discusses two of these, communication-system and spatial structure.

Communication structure references the observable patterns of symbolic exchange among actors in the classroom. One of the fundamental, observable properties of the classroom is that it does not always constitute a single, interacting group. In fact, the number of occasions when all members of the classroom are paying joint attention to a given stimlus may be in the minority. Often classrooms may be observed in which one or more individuals are gazing elsewhere or whispering to their neighbors or in which independent groups have been created for various purposes. The number and size of communicating groups, therefore, constitutes an observable property of classroom structure. Additionally, it is also possible to discriminate communicating roles within groups, and Adams suggests that three roles may usefully be discriminated: those of the initiator -- a person who is engaged in information transmittal (if any), the target -- a person to whom the initiator addresses himself, and the audience -- those who witness the information transmitted.

Persons within the classroom are not only locatable with respect to communication systems, however. Adams suggests they may also be locatable physically -- with respect to the bodies of others in the room, the characteristics of the room itself, and proximity to fixed physical props such as the chalkboards. Thus, the unique arrangements of bodies of participants within the classroom at any given moment in time constitutes a spatial structure. It is also possible, as Adams suggests, to interrelate these two structural components, to observe the physical structures of communicating groups for instance.

Classroom Function. Adams also suggests that it is possible to observe classroom functioning, that one may discriminate what the classroom is doing. Again, two concepts are suggested for function, content and manner.

Communicating groups exchange information, and gross or fine distinctions may be made about that which is exchanged. Adams suggests a four-category scheme for coding content. Given a knowledge of the subject assigned to the classroom lesson, intrinsic subject matter is content that pertains to the assigned task. Other types of subject matter are referred to as extrinsic. The two forms of subject matter are alike in that both deal with symbols that have as their referent things other than people and interactions being carried on in the classroom; they are "fact" rather than "process" oriented. The other two forms of communication concern events of the classroom itself. Sociation is coded whenever the communicating group concerns itself with the states of individuals in the classroom. Organization is coded whenever the group concerns itself with the administration of the classroom.

Manner deals with the observable styles in which classroom interaction takes place. Examples of frequently-used words that are manneristic in orientation are those of "discussion," and "lecture," but Adams suggests that these are not particularly useful in discriminating among contemporary classrooms. Rather, three types of manners are discriminated. Operation refers to the limiting case in which groups are not really exchanging information but are rather performing non-symbolic acts (such as group singing, recitation, or the making of aeroplanes). Information dissemination refers to all communication exchanges devoted to the conveying of information. Intellectualization refers to exchanges devoted to reasoning, considering, deductive and inductive thought, opinion giving, judgment making, assessing and evaluating, and interpretation making. Whereas the emphasis in information dissemination is upon "facts," the emphasis in intellectualization is on "understanding." Once again, Adams suggests an interaction between the two major forms of classroom function and adduces hypotheses about the effects of formal properties of the classroom upon both structure and function.

Classroom Solidarity. A quite different form of classroom structure is suggested by Rosenblatt (in Chapter VI). One of the implicit assumptions made by Adams is that of observability -- structural and functional properties suggested throughout his essay are those that may be reliably observed. Rosenblatt's concern is with another structural concept, social solidarity, the inferred coherence of the classroom (or any other social system). As is pointed out by Rosenblatt, it is possible to operationalize solidarity in various ways, by measuring commonality of allegiances and attachments, by observing communication patterns, by studying affective properties of exchanges, and the like. He also suggests the possibility that these different methods of measurement may actually be tapping distinct variables.

Solidarity of various "other" types of social systems has long been studied. For instance, the literature reports findings for discussion groups, industrial organizations, military squads, and the like. Previous applications of solidarity concepts to the classroom have emphasized the solidarity of pupils. Rosenblatt suggests that this is but a limited way of conceiving solidarity. Since the teacher is a participant in classroom interaction, solidarity bonds between the teacher and pupils are an important determinant of classroom outcomes. Rosenblatt also offers a number of hypotheses concerning the origin and effects of classroom solidarity.

Individuals in Education

There is a tendency in contemporary education to reify the individual. Persons are seen, somehow, as having greater and more apparent reality than the social systems of which they may be a part. If, as has been suggested, we also tend to assume that societies "cause" social events, it is "to people" that social events happen. In part this tendency reflects the individualistic orientation of our language and value systems. In part, it probably also reflects the fact that psychology developed at a somewhat earlier date than did sociology or anthropology. In part this tendency must also reflect the commonly stated purposes of education (its manifest functions) which focus on the development of the individual pupil.

For whatever reasons, the current literature of educational psychology, philosophy (and sociology!) show a remarkable tendency to focus on the pupil and to ignore both the other persons who are involved in education and the other social systems which may be conceptualized within the educational institution. Thus, our concern within educational research has primarily been with pupil growth, achievement, adjustment, and happiness. Largely ignored are the effects of education on the teacher, the administrator, the parent. And for the most part the institution, organizations, and settings of education are viewed as instrumentalities whose effects on the pupil are to be examined rather than interesting entities whose properties might be examined in their own right. Not only has this emphasis kept us from considering many of the most interesting functions of education, but it has also prejudiced the concepts we have used for thinking about even educational effects in the pupil. Our primary concern has been with learning, for instance, rather than with exchange; with adjustment rather than acommodation; with socialization rather than with the effect of the individual (even the pupil!) on the social system.

Role Concepts. If we turn aside, briefly, from the pupil to other actors in the school, it becomes clear that teachers live in a world whose perspective is far different from that of the pupil. Despite his involvement in classroom interaction, the teacher's major reference group is that of the other adults in the system. Teachers are characteristically found on the lowest rung of a complex social system in which supervisors, principals, and superintendents appear to vie with one another in their enthusiasm to "have at" the lowly teacher. And yet the teacher is unique (perhaps among all professionals) in that his job performances are carried out in isolation from both those who would evaluate his efforts and from observation by his peers. Teacher performances, then -- the teacher's role -- must be strongly effected by role conceptions held by the teacher and, at least indirectly, by the conceptions for his role held by others for him.

In Chapter VII, Biddle, Fraser, and Jellison present a general discussion of the problem of relating teacher-held role conceptions with teacher classroom performance. A series of concepts for differentiating role conceptions is presented by the authors. Role conceptions are conceived as transitors; i.e., as referential statements. Transitors may deal with the observable characteristics of others or with conceptual processes occurring within others. Transitors come in a variety of modalities, including those of demand (norms), description (anticipations), evaluation, question, and others. Various characteristics of object persons may be discussed in transitors, and it is pointed out the object persons referenced may either be individuals or social positions.

In the treatment given by Biddle, Fraser, and Jellison, role transitors may either be used to map the conceptions held for their professional role by teachers or the actual classroom performances of teachers. It is pointed out that classroom discourse may be expressed as a series of transitors, but that in most cases the most salient norms, anticipations, and values held by teachers are not those expressed directly by teachers to pupils in the classroom. Instead, in most previous studies of teacher-held role conceptions, it has been assumed by the investigator that conceptions should be measured by phenomenal report -- through questionnaire or interview schedule -- rather than estimated from actual behavior. Although there have been both a great many studies of conceptions for the teacher's role and direct studies of teacher classroom performance, the authors point out that few if any studies have yet appeared in which these two phenomena have been correlated. Instead, most previous investigators have appeared to make the assumption that teacher-held norms (or anticipations, or values) predict directly to teacher performance -- an assumption questioned by the authors. Their essay terminates with the stating of a series of hypotheses about the relationships between teacher-held conceptions and teacher performances. The relationship is seen to depend in part on the personality of the teacher, the nature of the classroom situation, and the type of role conception involved.

The Learning of Norms. In a closely related essay

(Chapter VIII) Videbeck applies role concepts to the discussion of classroom learning. Suggesting that the concept of norm is essentially that of a syllogism in which behavior of the individual is approved or disapproved by a powerful other, Videbeck discusses the contingencies affecting the learning of norms in the classroom. For the author, the behavior of the teacher acts as a transducer of pupil interaction; teacher behavior is meta-behavioral. Meta-behaviors may, however, be broken into analytic classes. Deterministic acts are those which give direction to the actions of other persons and are usually revealed by the grammatical form of the imperative mood. Evaluative acts are those which can be interpreted as bearing a comment upon action that has already transpired. In contrast with the meta-behavior of the teacher, pupil actions are considered to be transitional, and may either be obtrusive or unobtrusive. In the final sections of his paper, Videbeck concerns himself with the development of propositions that predict the learning of norms (i.e., syllogisms of behavioral approval) from observable sequences of deterministic, evaluative, and transitional acts. As was the case with Adam's essay (Chapter V) , Videbeck's propositions are designed to be tested through actual behavioral observation within the classroom.

There is considerable overlap in the concepts used in Chapters VII and VIII. This may most easily be seen if it is assumed that Videbeck's "acts" are functionally equivalent to the "transitive behaviors" of Biddle, Fraser, and Jellison. The distinctions made by Biddle, Fraser, and Jellison are primarily oriented towards personalistic contingencies presumably determining the behavior of the teacher and de-emphasize classroom interaction. For Videbeck, classroom interaction is the major issue to be discussed, since it is only through overt interaction that the teacher influences the pupil. Interestingly enough, neither essay concerns itself with the effects of classroom activity on the teacher (see, however, Biddle and Adams, 1966).

It is also interesting to consider the relationships between these last two essays and that of Chapter II. While Wilson makes a general distinction between ideology and behavior, in Chapters VII and VIII these two realms are broken into analytic components. Concepts used by the authors of the last two chapters are designed to accomodate the behaviors of individuals, however, rather than those that form a common culture. From the viewpoint of these last two chapters, the existence of culture (i.e., consensus of ideology or behavior) is an empirical assumption that may or may not be supportable in a given situation rather than a basic assumption. Finally, despite the overwhelming importance assigned by the authors of Chapters II and III to the primacy of technology, the physical environment plays a vanishingly minor role in the last two essays. The disappearance of the physical environment from the last two essays suggests either that the authors believe they are investigating general properties of social systems that transcend the physical environment or that they are willing to work within the common, physical limitations of the classroom setting. This point is taken up again below.

The Problem of Media Impact

A general model has been presented in which concepts for education are set forth at five, different levels of analysis -- the society, the institution, the organization, the classroom, and the individual. Given this model, what implications may be suggested for the study of educational media impact? I shall consider first the study of media impact at each of the levels separately and then conclude with observations about the model as a whole.

Media Impact and the Society

One way in which educational media may affect education is by working changes in the society in which education is imbedded. It seems unlikely, however, that educational media alone will have much affect on society; rather, educational media reflect the new developments appearing in communication technologies generally. Consequently, the proposition I shall consider here is that developments of communication technologies will affect the form of society and will, in turn, produce a change in education.

It seems clear that this proposition is but a corrolary of the general argument put forth by Wilson and Green that technological developments affect the form of culture within a society. It is interesting to note, however, that neither author concedes primacy to communication technologies in determining the possible forms of society -- rather, their emphasis appear to be given to agricultural and industrial techniques. Perhaps one reason for this de-emphasis is the fact that communications techniques may be used for various purposes within a society. Literacy, for instance, may be used for keeping records (hence, mercantile promotion), for communicating-at-a-distance (hence, the development of news services), for sequestering knowledge in the hands of the few (hence, the promotion of a military or religious elite), for passing on knowledge to the next generation (hence, the support of science, history, and education). Which of these functions, and others, will be chosen within a given society that develops literacy would appear to depend on pre-existing conditions within the society, thus making the development of definitive predictions about media impact difficult.

It seems worthwhile, however, to suggest a counter argument. If the development of communication media does not lead to definitive predictions about their use in societies, at least the presence of media leads to the possibility of behavior forms that would be impossible without communications media. A society that is not literate, for instance, has few means for maintaining complex behavioral forms such as organizations. The difference between non-literate and literate societies is, in fact, so puissant as to lead some observers to term the latter "high civilizations" although a few, highly complex societies have developed without literacy (such as the Inca). Again, although the development of printing might imply either the development of free and widely-distributed news or the tight control of state- sponsored propaganda, neither of these behavior patterns is possible without a means for the inexpensive reproduction of printed material.

There is at least one additional argument for considering the impact of communications media to be unique. The development of almost any new technology has a predictable effect upon society; as the new invention is developed an industry is created for its development, manufacture, distribution, repair, and disposal. Jobs are created, new positions appear, needs are created among consumers, other institutions must accommodate to the demands of the newcomer. However, when we turn to the communications field, two unique effects appear that do not always accompany other technological changes. In the first place, communications media are not always used for their instrumental capacities; rather they are adopted for their own intrinsic value. Automobiles, steam engines, and atomic bombs are used primarily because they do a job more efficiently, thus freeing the labor of their consumers to be spent in other, more pleasant pursuits. Books, motion pictures, and television are adopted not because they free time (although they may also be used for these purposes in some contexts) but because they fill time. In other words, people like to read, to view motion pictures, to watch television; communications media fill expressive needs. In the second place, it is difficult to utilize a communications medium without expanding ones horizon. While an automobile, steam engine, or atomic bomb (!) may be used without discovering anything beyond the technology of the instrument itself, the book, motion picture, or television set appears to have the intrinsic characteristic of reducing ignorance and ultimately of making possible the assemblage of larger social systems -- including that of one world. (For additional discussions of these propositions see Rossi and Biddle, 1966.)

The above observations may be summarized with three propositions: (1) The development of a new communications technology does not lead to definitive effects within a society; rather a series of possible effects is generated among which the society will choose, one or more depending on pre-existing conditions within the society itself. (2) Despite the above disclaimer, communications technologies tend to fill time and to be sought for by consumers as opposed to other ways of spending time (such as education). (3) Again, the appearance of new communication technologies facilitates the storing and exchange of ideas, stepping up the efficiency of education, reducing provincialism, and making possible the assembly and stability of larger social systems. It would seem that these propositions are capable of empirical test. (For an expanded discussion of their implications, again see Rossi and Biddle, 1966.)

Media Impact and the Institution of Education

It was noted earlier that none of the essays in this volume considers directly the possibility that the institution of education might be directly affected by the appearence of new educational media. There are actually good reasons for this neglect. Most of the measurable characteristics of institutions are also characteristics of organizations; indeed, it is difficult to separate these two concepts for contemporary society. (Within primitive societies the concept of institution is more useful, especially where there are few organizations to be seen.) The institutional characteristics used by Wilson for creating his typology, for instance -- membership of the pupil position, recognition of the teacher position, and the recognized purpose of education -- may also be considered characteristics of contemporary educational organizations. Rather than attempt to separate institutional from organizational characteristics, I shall lump all observations into one section and consider only the impact of media on educational organizations.

Media Impact and Educational Organizations

To the author's knowledge, there is at present no reasonably complete list of organizational characteristics that might be examined for possible media impact. Some organizational characteristics have been suggested in the essays of this volume, however, and it is useful to speculate about the impact of educational media on them.

Size. It seems likely that the adoption of new educational media leads to the enlarging of educational organizations and opportunities. The invention of writing makes possible the standardization of education from classroom to classroom, while printing offers an opportunity to extend education to massive numbers of persons. Similarly, educational television makes possible the bringing of specialized instruction to the isolated classroom, while public address systems, typewriters, and new methods of duplication make the operation of the large, comprehensive highschool far easier. Not only do communication technologies make possible the larger social system, but the efficient adoption of media technologies almost requires size. The cost of printing books drops sharply as the number of readers rises; educational television is prohibitively expensive unless shared among a large group of schools; and the like.

Standardization and Individualization. At first glance it would seem that the adoption of new educational media would lead to great standardization of the educational product -- in short, to conformity. Is conformity not implied when 100,000 pupils are using the same textbook or watching the same television presentation? It seems inevitable that standardization of means is nearly inevitable. Given the cost of media innovations, it is unlikely that schools will adopt more than a single system of educational television, teaching machines, or language laboratories. And yet, it is to be questioned whether the overall effect of a media revolution is that of standardization. Two or three centuries ago even our most sophisticated ancestors had a far narrower choice of books to read than is available in the average public school library today. Over time we would presumably build up equally flexible systems of television-program recording and individualized instruction through the teaching machine. Indeed, if educational media have the impact (along with other communications devices) of destroying provincialism, it would seem also likely that they tend to enlarge the opportunities of the individual pupil and allow for greater variety of educational offerings. This suggests that the pupil of the future will be a person of individualistic interests -- within the context of a homogeneous society!

Positional Structure. It would seem almost inevitable that the positional structure of education will be enlarged and differentiated with the appearance of new educational media. The early "school" offered only two positions -- those of teacher and pupil. The multi-classroom school required an administrator. The school that depends on printing needs educational authors, editors, printers, and book salesmen. The school of the future will need television playwrites and actors, electronic technicians, computer engineers, operators of teaching machines, role models. Indeed, in the very near future we shall probably find a continuing breakdown of the monolithic "teaching" position into a series of specialties. That this has already begun may be attested by the appearance of specialized language instructors, coaches, special educationists, counselors, and librarians within the comprehensive school of the mid-twentieth century. The new educational media appearing today will not only require additional specializations but have the potentiality of releasing the classroom teacher from much of the drudgery of education thus freeing him for specialization and the human tasks that cannot be carried out by television or the teaching machine. It also seems likely that with the use of newer and more flexible media there will be a breakdown of the pupil position into groups of persons with similar interests and abilities and the gradual abandonment of grades and lock-step education.

Educational Purposes. It seems likely also that the adoption of new educational media will lead towards the expansion of the mission of education. Whereas the earliest schools were mounted purely for purposes of socialization, with increasing awareness of positional differentiation contemporary citizens demand of schools not only a general education but also a vast variety of specialized trainings. The contemporary university has also taken over such diverse functions as those of entertainment, scientific research, information storage and retrieval, and the provision of public services for persons and other organizations. Whereas it would be "possible" to separate out these various purposes of contemporary education, the utilization of modern educational media makes their joint pursuit within a single organization both possible and efficient. It seems likely that this tendency will not only be continued within the university but will appear with greater frequency at the secondary and primary levels.

Media Impact and the Classroom

A number of classroom characteristics have been suggested in the essays of this volume, and it is useful to speculate about the possible impact of new educational media on them. For convenience, I shall first consider the functional and informal classroom characteristics covered in the Adams and Rosenblatt essays. This will be followed by a paragraph on formal classroom characteristics.

Informal Characteristics. Several changes in classroom functioning have already been suggested in the above paragraphs. Educational media have the capacity for altering significantly the role of the teacher in the classroom. Consider the role of the teacher during a television session. Shall the teacher serve as a monitor, a commentator upon the program, one who retires to his desk to grade papers, or indeed one who is then free to absent himself from the room? There is a "live" quality to both educational television and the teaching machine so that while they are in use the pupil's attention is caught more or less completely and the teacher becomes superfluous. At the same time, if such sophisticated media as these can replace some of the drudgery associated with drill and recitation, the teacher is freed to devote his attention to other tasks such as those of counseling and role modeling. This suggests that the educative media devices are likely to take over much of what has been conceptualized as information dissemination while the teacher concentrates on intellectualization, sociation, and group maintenance. It also seems likely that with the development of media systems that individualize instruction there will be fewer public and invidious distinctions made among pupils' abilities thus removing one barrier to interpersonal solidarity in classrooms.

The reader may detect in the above paragraph an unspoken assumption -- that the newer educational media cannot replace the teacher. Minor revolutions have taken place in educational media during the past century (such as the development of the chalkboard and paper-back books), yet the role of the teacher is still as necessary in education as it was a hundred years ago. With the appearance of new educational media based on electronics technology it would seem that the role of the teacher will change, but it is far more likely that the change will be an expansive one -- to meet the expanding needs of education in our complex society. At this point an analogy may be drawn between the introduction of new media and the use of other, non-communicative devices. The introduction of carpeting in the classroom, for instance, leads to a striking reduction in the rate of classroom deviancy and more time spent in subject-matter pursuits by both teachers and pupils. The television set or teaching machine can no more "replace" the teacher than can the carpet, although each may be used to enhance classroom education.

Formal Characteristics. Standing in contrast to the above predictions, it would also seem that the newest educational media have the ultimate potential of so altering the formal characteristics of classrooms so as to abolish the classroom as we know it today. Consider the joint effects of: (a) individualized instruction through the use of computer-controlled teaching machines, (b) the development of specialized facilities for shop, arts and crafts, electronics, and athletic instruction that have already greatly modified the concept of the classroom in comprehensive highschools, (c) the prospect of the abandonment of grades, and (d) recent developments in educational architecture. If we take these developments to their extreme, it would appear that the school of the future will consist of a series of highly specialized spaces devoted to different types of "teaching," and that even in those cases where it is necessary to assemble a classroom-sized group of pupils together for mutual support or stimulation that the boundaries of the space may be composed not so much by walls as by display screens, movable partitions, devices for controlling light and other physical properties, and vistas. It is possible that the study of "the classroom" may be the study of an obsolescent social form.

Media Impact on the Individuals in Education

Rather than review the voluminous literature covering media impact on the pupil, I shall confine the present discussion to two observations suggested by the concepts presented in this volume.

(1) Many persons are involved in education beyond the pupil. Apart from teachers, contemporary schools also involve administrators, service personnel of various sorts, parents, school board members, suppliers, and interested members of the public at large. Apart from pupil effects, educational media may have an effect on any of these groups of persons. Teachers may be stimulated or frightened by educational television; the administrator may use a public address system for communicating or spying on the classroom; parents often have strong opinions about language laboratories; the university good music station spreads a blanket of high culture far beyond the campus, and so on. Once one gets outside of the narrow confines of the pupil-learning paradigm, it becomes apparent that the adoption of educational media procedes from many causes and has many effects throughout the cadre of school participants. Given the multi-faceted purposes of education today, it is as important to study the effects of media on teachers, administrators, and other adult participators in education as it is to study pupil effects.

(2) And when we turn our attention to the study of media

effects in others, it becomes clear that the traditional variables of educational research -- achievement, attitudinal development, social adjustment -- are inappropriate for the task. Teachers may possibly learn from operating a television set, but it is of little moment to know this information. Rather, it is necessary that we conceptualize the new educative processes made possible by media adoptions and the opportunities, problems, fears, and understandings teachers have of these processes.

Media Impact and the Social Systems of Education

Of necessity this discussion of media impact on the social systems of education has been speculative. As was suggested at the beginning of the chapter, the conceptualization of social systems in education has been but limited to date, and most media research so far has focused on pupil impact. This does not mean that it is impossible or unfruitful to carry out research on media impact elsewhere in education. On the contrary, such research is both practical and likely to generate results of social significance. It does, however, require some adjustments in our thinking about research techniques.

The "classic" study of media impact is an experimental design having two or more groups which are subjected to varying media treatments with the dependent variable consisting of a measure of pupil growth or attitude. Unfortunately, such research designs are inappropriate for the study of media effects on societies, institutions, educational organizations, classrooms, and

and teachers.

Two primary techniques are available for the review of societal and institutional differences; the use of ethnographic records and the comparative study. Using the former technique, we would seek to test hypotheses about education by searching records of the hundreds of known (historical and contemporaneous) societies to find examples of those conditions appearing as independent variables in our hypotheses. In the methodology of the comparative study, societies or educational institutions differing in one or more known characteristics are subjected to a standardized methodology -- such as a questionnaire or interview schedule -- to ascertain dependent variable differences. The study of organizations requires that we develop means for measuring organizational characteristics -- which usually consist of instruments that are administered jointly to a number of respondents within the organization -- and then that a number of exemplar organizations be studied in comparison with one another. The study of classrooms necessitates that one use a method for "freezing" records of classroom interaction (such as video-tape) that records then be obtained from a large variety of classrooms differing in pupils, teachers, subject matters, organizational contexts, and conditions of media usage. The study of teachers and other non-pupils in education requires merely that we set out to do so.

In Chapter VI Rosenblatt comments on the lack of research in educational settings by social scientists who are not educationists. Time and again the authors of the essays of this volume have had to turn to analogous social systems in non-educative contexts for related work. It is not that the social systems of education cannot be studied, but too often they have not been studied. In terms of participants, education is by far the largest institution in contemporary society. If we are to understand, to predict, to control its effects on our lives, it is patently necessary that we look at all aspects of this institution. The study of pupil growth and development is but one important task of educational research, but even the study of pupil development necessitates that we understand the nature of the classroom, the teacher, the school to which the pupil is exposed. Far too often our "understanding" turns out to be nothing but unsubstantiated educational ideology, and when we look at the social systems that imbed the pupil, they turn out to be enormously different from what the textbooks say they should have been. But when we honestly turn our attention beyond the pupil, we discover that education serves a vast array of needs in the community, needs that are gradually coming to be as important as those of pupil socialization. To understand the social systems of the institution that serves these needs is of absolute importance.

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CHAPTER II

ON THE EVOLUTION OF EDUCATION

H. Clyde Wilson

> Indeed, education as practiced in a given society and considered at a given moment of its evolution, is a totality of practices, of ways of doing things, of customs which constitute perfectly defined facts and which have the same reality as other social facts -- Emile Durkheim.

Introduction

The task of this essay is to develop a framework for a study of the evolution of education. To this end I shall attempt to establish a set of criteria upon which the evolutionary stages of education may be established and to trace in broad outline a sequence of evolutionary stages of education from the least developed cultures to the most advanced. The basic concepts underlying this study were stated by Durkheim (1956:95-98) over fifty years ago:

> Educational practices are not phenomena that are isolated from one another; rather, for a given society, they are bound up in the same system all the parts of which contribute toward the same end: it is the system of education suitable to this country and to this time. Each people has its own, as it has its own moral, religious, economic system, etc. But on the other hand, peoples of the same kind, that is to say, people who resemble one another with respect to essential characteristics of their constitution, should practice comparable systems of education. The similarities in their general organization should

necessarily lead to others of equal importance in their educational organization. Consequently, through comparison, by abstracting the similarities and eliminating the differences from them, one can certainly establish the generic types of education which correspond to the different types of societies. . . Once the types were established, we would have to explain them, that is to say, to seek out the conditions on which the characteristic traits of each of them depended, and how they have emerged from one another. One would thus obtain the laws which govern the evolution of systems of education. One would be able to perceive, then, both how education developed and what the causes are which have determined this development and which account for it.

Durkheim's grand program for a study of the evolution of education has not been realized; this paper is only an initial step toward his goal.

Several concepts underlying this study must be discussed in order to provide a background for understanding the development of the evolutionary stages of education as attempted here. These are the nature of culture, the nature of evolution, and the nature of education.

The Nature of Culture

'Culture' is defined here as a class of phenomena dependent upon man's ability for articulate or symbolic speech (White, 1949:139-140). This class has four characteristics which are important for the problem at hand. First, culture is considered to be "superorganic," and, therefore, a distinct order of phenomena analytically separatable from the biological factors of man (Kroeber, 1917; Kroeber and Kluckhohn, 1963:289; White, 1949; Durkheim, 1938). This means, without denying the importance of that part of psychological theory which has its roots in biology, we may proceed with this study with the assumption that the physiological bases for learning, perception, and so on, do not vary from population to population and are not factors in explaining cultural variation. Further, this point of view emphasizes the role of the cultural tradition in determining human behavior and minimizes the role of the individual: "There is no man who can make a society have, at a given moment, a system of education other than that which is implied in its structure, just as it is impossible for a living organism to have other organs and other functions than those which are implied in its constitution" (Durkheim, 1956:94).

Second, culture is transmitted from one generation to the next by symbolic behavior and, therefore, must be acquired or learned anew by each generation from the preceding generation. This characteristic of culture has probably impressed anthropologists the most. It was stated explicitly in Tylor's classic definition of culture and has been emphasized repeatedly in later definitions (see Kroeber and Kluckhohn, 1963). If a cultural tradition is continued, then every aspect of that culture must be transmitted in detail to the succeeding generation. The means by which this transmission is accomplished is the point where the interests of the anthropologists and the educationalists are as one. In this paper the fact of cultural transmission will be an important consideration in defining "education" and in establishing criteria for a typology of education.

Third, culture is cumulative; each successive generation builds upon the past. This allows the next generation to begin where the last generation left off. This characteristic should be manifested in a tendency for the number or types of education to increase with time. Another implication of this characteristic of culture is that emergent cultural forms are determined to a large extent by the preceding cultural forms: "Our most fruitful innovations consist very often of casting new ideas in old molds, which it is sufficient to modify partially in order to adapt them to their new content"(Durkheim, 1956: 145-146).

The fourth characteristic of culture to be considered is that culture is an adaptive mechanism. Man like other animals must adapt to his environment. While other animals adapt by almost exclusively biological mechanisms, man adapts almost exclusively through his culture. Selection is inherent in any adaptive process, and the implication here is that the particular types of cultural adaptation are finite and knowable; therefore, the types of educational systems are finite and knowable. Further, given the requirements which must be met in the adaptive process, the types of educational systems which would meet these requirements would fall into a narrowly determinable range.

The class "culture" may be divided into three parts -- objects, acts, and ideas (White, 1949:130-140; Parsons, 1951:4; Huxley, 1958:437). A number of social scientists, beginning with Alfred Weber in 1920 and including Murdock, MacIver, Kroeber, and White, have suggested these three divisions of culture make-up the three sub-systems of a cultural system -- technology (objects), society or social organization (acts), and ideology (ideas) (Kroeber, 1952:152-166; Kroeber and Kluckhohn, 1963:182-190.) Studies of culture may concentrate upon one of these sub-systems, some combination of two of them, or attempt to deal with all three as a total cultural system. This paper will be concerned with only two of these sub-systems, technology and society. Technology is regarded as that part of culture which is most immediately involved in the adaptive process between man and his environment. If technology is not the primary determinant of the other two sub-systems of a culture, as White (1959:33-57) has strongly argued, it at least sets definite limits upon the range of variation possible for society and ideology. A consideration of technology has the additional advantage in that in establishing levels of cultural development, technology appears now to have the greatest possibility of being objectively quantified or ranked. The classification of levels of cultural development used in this paper is based to large extent upon technological factors (Beardsley et al, 1956:134).

If technology is the primary means by which man, through the use of objects (e.g., tools) adapts to his environment, then society is the primary means by which human relations are organized to carry out this adaptive process. This adaptive process of society includes such obvious things as a division of labor and means of controlling production, distribution, and consumption, to less obvious things such as the formation of social groups from rules of descent, rules of marriage, and rules of post-marital residence. Education is primarily a set of social acts, a part of society, because it is through social interaction that the process of cultural transmission occurs. Thus, in this paper, both the definition of education and the criteria for establishing educational types are derived from the societal sub-system of culture.

The third sub-system of culture, ideology, will not be considered directly. This is not to deny the importance of systems of beliefs, sentiments, values, ethics, and so on, which are a part of ideology. Durkheim (1956:70-71) considered the transmission of ideas to the child one of the primary functions of education. Further, throughout all of his works he emphasized the role of "collective ideas and sentiments" in maintaining the social order and in providing a basis for the continuation of the social order from one generation to the next. Studies of ideological sub-systems are almost exclusively concerned with content -- sacred and profane, big and little tradition, traditional and progressive, designs of living, patterns of culture, and so on. On the other hand, studies of social technological sub-systems may be concerned with content and/or process. Since I shall be concerned primarily with process in this paper, I have not found it useful to concentrate on the ideological aspects of education.

The Nature of Evolution

Anthropology is primarily a comparative science (see Eggan, 1954). However, there are a number of ways in which comparisons can be made (Berlin, 1962). One of the more useful ways of classifying comparative studies is in terms of the way the temporal and spatial dimensions are treated (White, 1945; Spaulding, 1960). A study may regard time as a variable or hold time constant, i.e., a study may be temporal or non-temporal. A study, also, may regard space as a variable or a constant, i.e., spatial or non-spatial. Since time and space may be regarded as independent of each other, there are four possible frameworks in which studies may be carried out. Those studies which are spatial and non-temporal are concerned with culture areas and diffusion. Studies which are non-spatial and non-temporal are functional or structural-functional studies. Studies which are spatial and temporal are historical studies. Finally, studies which are non-spatial and temporal are evolutionary studies. The distinction of functional and diffusional studies from other types of studies is well established; however, the distinction between historical and evolutionary studies is less well understood. The difference between evolution and history is of some importance; a "history of education" is very different from an "evolution of education," and a study in one of these frameworks should not be judged in terms of the framework or criteria established for the other.

History is concerned with events on a time-space continum. Each event is unique since it occurred at one time in one place. There are a large number of historical studies of education ranging from the history of education of a major civilization to the history of secondary education in Massachusetts. The various stages or levels in a historical study of education are what Simpson (1945: 17-20) calls a phylogenetic or vertical classification. The whole developmental scheme is based upon known or assumed historical relations between the various levels.

An evolutionary study of education, on the other hand, is concerned only with a relative sequence of events. The events are grouped into classes on the basis of their similarities of structure. This type of classification, which treats events as members of a class rather than as being unique, (Simpson, 1945: 17-20))calls a morphological or horizontal classification. The horizontal classes are then placed in a temporal sequence on the basis of various criteria, which will be discussed below.

The similarities and differences between historical and evolutionary studies can be illustrated by discussing the various types of temporal studies. First, there is the study of a series of unique temporal-spatial events which are called history. Second, one may generalize from this series of temporal-spatial events, which may be called "generalized history." For example, the changes occurring in education during the industrialization of the Nineteenth Century in the United States may serve as a model for what happens generally to education during industrialization. The problem here is to determine what is general about this sequence of events and what is unique to that particular time and place. The third type of temporal study attempts to deal with this general versus unique problem by studying several historical sequences. For example, the changes in education during industrialization in several areas in which this has occurred. This type of temporal study would provide a basis for determining what is general to this change and what is unique for each area. This is called multilineal evolution by anthropologists (Steward, 1955). The next logical step after determining a number of general trends in a series of historical studies is to establish a universal trend; for example, what changes occur in education during industrialization regardless of specific time and place? This final level of analysis is the fourth type of temporal study which is "general evolution" or "unilineal evolution."

Now, if we had a series of histories of cultures, including data on social organization and ideology extending from the Paleolithic to the present, then the process of moving from "history" to "general evolution" would simply be a process of increasing levels of generalization; i.e., of moving from the most particular to the most general. Such is not the case. The historical sequences established by the archaeologists are based almost entirely upon the material objects which have survived and, therefore, provide information primarily about the technological sub-system of the culture. This is not to belittle the contributions of archaeology -- over ninety-nine per cent of the total history of man is known only from the archaeological record -- but to point out the impossibility of using archaeologically established sequences for the type of detailed study of education proposed in this paper.

Lacking established historical sequences which include information on social organization and ideology, the unilineal evolutionists turn to the only source of data available, the ethnographic record. Their reasoning is as follows: known cultures with similar technologies also have similar societies and ideologies; therefore, cultures in the past which had technologies similar to these known cultures also had similar societies and ideologies. Thus, contemporary cultures with Paleolithic technologies may be regarded as "living fossils," and the society and ideology of these contemporary cultures may be regarded as examples of the "general class" of societies and ideologies found in the Paleolithic. This assumption has been questioned (Herskovits, 1956:70-71); however, its validity is not established by polemics, but by its usefulness or uselessness in scientific interpretation.

The problem of the evolutionists is to place the known contemporary cultures into an assumed or hypothetical temporal sequence. The most obvious procedure for doing this would be to place the contemporary technologies in the order of chronological development found in the archaeological sequence. Beardsley and others (1956) have attempted such a correlation. This is only one of several schemes that might have been used; however, it has the advantage of a high degree of consistency in the criteria used for determining the various stages of development, and it covers the whole range of archaeological and ethnological examples. For these reasons this sequence will be the one used in this paper.

The methodology for establishing a unilineal sequence of evolutionary stages of education will be carried out in three steps. First, an acceptable evolutionary classification of cultures established by other investigators will be taken as the "given" or "independent variable." Second, a classification of education based upon evolutionary criteria will be established. Third, an attempt will be made to correlate tentatively the stages of cultural evolution with types of education. However, first I must make clear the nature of education as it will be regarded in this paper.

The Nature of Education

"Education" may be regarded as a class of events ranging, at one extreme, from anything which has ever happened to an individual to, at the other extreme, that which happens to an individual in a classroom in the presence of a teacher. While it is true that one may consider "education" anything he wishes, the usefulness of a concept depends, at least in part, on its having some reference to more commonly understood meanings. This places a limitation on the nature of "education." Another limitation is that the nature of "education" must be suitable to the purpose at hand, in this case, must have meaning in terms of an evolutionary sequence. A third limitation is that "education" must be defined in a way which makes it likely that the activity will be described in a typical ethnography. An acceptable definition can best be developed by isolating varying degrees of specificity.

Everything that happens to an individual I shall call "experience." This includes "things" biological such as being male or female, the color of one's skin, body size at different stages of physical development, the order of birth in relation to siblings, and so on. It includes "things" which happen to an individual quite aside from his participation in a society such as falling into a river, hearing a mocking bird at night, smelling a grass fire, seeing a tree struck by lightening, and so on. It also includes all of those "things" which happen to the individual as a consequence of social interaction.

Everything that happens to an individual involving interaction with another individual I shall call "social awareness." This includes such "things" as being pushed in a crowded subway, catching a fly ball, being smiled at by a girl, and so on. It also includes less direct social interaction such as reading a book, seeing a movie, and listening to records. Finally, it includes those social interactions which have the consequence of equipping the individual for effective participation in his society or some segment of his society.

Everything that happens to an individual involving social interaction which equips him for effective participation in his society or a segment of his society I shall call "socialization." This includes such things as playing house, dressing-up in adult clothes, playing nurse, and so on. It also includes mowing the lawn, being president of the neighborhood club, taking care of a younger sibling, and so on. Finally, socialization includes social interaction involving two or more people where at least one of the actors has as his purpose the instruction of at least one of the other actors.

Everything that happens to an individual involving social interaction where at least one actor has as his purpose the instruction of at least one other actor I shall call "education." This includes such things as one friend telling another about sex, an older brother showing a younger brother how to hit a ball, a senior showing a freshman how to fill out a classcard. It also includes a mother showing a child how to dress, a Sunday School teacher telling a Bible story to a class, a plumber showing a helper how to open a clogged drain, a mathematics teacher explaining the binomial theorem.

This increasing degree of specificity could be continued. For example, we might consider informal and formal education, private and public education, primary and secondary education, and so on. However, further specificity would tend to defeat the second limitation of a definition of education; it would soon become too specific tobe useful for comparative purposes where a wide range of cultures and types of education are involved. On the other hand, the basic concept of education would appear to meet the first limitation; that is, it conforms to the general meaning of "education."

The third limitation or restriction on the definition of education can also be satisfied by this definition. "Purpose," as used in the definition, should be interpreted to mean intent or direction manifested in the behavior of the actor. Purpose, then, should usually be expressed in the ethnolographies by use of such active verbs as tell, show, demonstrate, instruct, teach, and so on. Activity of this type will normally be reported in a general ethnography.

Some implications of the above definition of education should be made explicit. First, all learning is not "education." It is clear that learning may and does occur at all levels more general than the level I have called "education." One learns by "experience": Fire burns. One learns "social awareness" through the most casual interaction: Others are polite, rude, or indifferent depending upon differences of age, sex, social status, and so on. And, "socialization" is by definition a learning process. "Education," then, is not characterized by learning, but by teaching. Also, what is taught, that is, what is a part of education, may vary from one culture to the next. In Western civilizations children are usually taught toilet practices; in many non-Western societies one learns toilet practices when he becomes old enough to imitate adults or older children. Many essential aspects of culture are not taught at all; natural speech is taught only in a few cultures where emphasis upon early childhood performance prevails, and in many cultures techniques necessary for survival, for example, techniques of hunting, are not taught. On the other hand, many aspects of a culture which on the surface appear to be trivial, for example, formal court etiquette, are taught with the greatest of care. A classification of cultures in terms of what a given culture selects as being important enough to see that it is taught to the next generation, as opposed to what is regarded as something one learns on his own, might provide an important key to understanding the role of education in culture. However, this task is outside the aims of this paper.

Social interaction as used in the definition of education is not limited to face-to-face interaction. As technology has advanced, the limits of interaction through both time and space have been greatly extended. This advance has been characterized by the development of writing, the printing press, mass production of paper, mass distribution of printed materials through a market system, telephones, radios, photography, movies, recorders, television, machine translators, and so on. To exclude, for example, textbooks and educational television from any definition of "education" would be to place such a restriction upon the definition as to render the concept almost meaningless.

In the preceding three sections I have discussed the concepts necessary for a study of the evolution of education. Culture was defined as a class of phenomena dependent upon articulate speech. The four characteristics of culture -- superorganic, transmittibility, cumulative, and adaptive -- were discussed. The class culture was divided into three sub-classes which were termed technology, society, and ideology. Evolutionary studies were defined as studies concerned with the temporal dimension and compared with historical studies which are concerned with both the temporal and spatial dimensions. Education was defined as social interaction involving two or more actors where at least one of the actors has as his purpose the instruction of at least one other actor. The next obvious step is to bring together and correlate culture and education in an evolutionary framework. The critical problem is a classification of culture stages and educational types:

It is impossible to speak of the objects of any study, or to think lucidly about them, unless they are named. It is impossible to examine their relationships to each other and their places among the vast, incredibly complex phenomena of the universe, in short to treat them scientifically, without putting them into some sort of formal arrangement (Simpson, 1945:1).

A Classification of Cultures

There are many classifications of culture, society, or some aspect of culture. Many of these classifications were devised for a special purpose and would not be suitable as the general type of classification we seek. Recent and general classifications have been offered by Oberg (1955), Steward (1948; 1955), Naroll (1956), Hester (1962), Service (1962), and Beardsley et al (1956). It would not be useful in this paper to offer an evaluation of each of these classificatory schemes. The classificatory scheme of Beardsley et al used in this paper will be explained, however.

The classificatory scheme of Beardsley et al is meant to be a general and universal classification:

> The fitting of all cultures in the world, living and extinct, into a single scheme, means that the definition must be in general terms, although it is remarkable how detailed they can be and still remain widely applicable. The details are not those that characterize and contrast distinct historical traditions, but those that distinguish culture types (1956: 133).

The single most important criterion used in this classification is community mobility, and the names of the various classes reflect this interest. However, the criteria are extended to include "the organization of economic, sociopolitical and ceremonial interrelationships within a community" (Beardsley et al, 1956: 134). Not only is this classification general, as we desire, but it also has evolutionary applicability: "We have tried to develop a classification of cultures that is usable with both ethnological and archeological data and that has functional and evolutionary as well as historical and descriptive significance" (Beardsley et al, 1956:133). Further, the classification contains the technological bias referred to earlier in this paper:

> We have further assumed that the primary factor in the dynamics of cultural advance from one category to another is an improvement in subsistence, although we recognize that on some occasions socio-political organizations may be an important consideration in accelerating or retarding this advance. We have taken it for granted that in general sedentary life has more survival value than wandering life to the human race, and that, other things being equal, whenever there is an opportunity to make the transition, it will be made. (Beardsley et al, 1956:134)

This classification, then, contains those four things we consider most essential: a consistent set of criteria, a set of general classes, an evolutionary framework of the advancement of the classes, and a technological explanation of the cultural advance of the class from one stage to the next.

The classification of Beardsley et al contains ten classes. Three of these are special classes which apply only to pastoral nomads and will not be considered further in this paper. Of the seven remaining classes, the first stage is a hypothetical stage not represented by any ethnographic examples and probably not represented by any archeological examples. Finally, the high stage in the development of the classification probably does not reach the level of modern industrialized societies. As Beardsley et al says in a footnote:

> This category includes a wide range of cultures, and it may be necessary to subdivide it. . .Our type description applies primarily to the pre-industrial form, which might be characterized as simple. With industrialization and the growth of scientific method, certain changes take place in the community integration, some of which are mentioned in the description. In the brief time at our disposal, we were not able to pursue the question whether these can be considered simply as merely more intensive developments of pre-industrial trends or whether they should be separated. . .(1956:145)

In this paper we shall follow the suggestion of the authors of this classification and add an additional class which includes modern industrial societies. The six stages in the original classification we are using and the one we have added will be briefly described.

I. Restricted Wandering. "Communities that wander about within a territory that they define as theirs and defend against trespass, or on which they have exclusive rights to food resources of certain kinds. Movement within the territory may be erratic or may follow a seasonal round, depending upon the find of wild food utilized" (p. 136). The technology of this stage of development is characterized by a seasonal variation in the available food supply, a lack of adequate food storage techniques, and an absence of domesticated plants and animals with the exception of the dog.

II. Central-Based Wandering. "A community that spends part of each year wandering and the rest at a settlement of 'central-base,' to which it may or may not consistently return in the subsequent years" (p. 138). The technological base at this level of development may be one of three types: "(1) a storageable or preservable wild food harvest, such as acrons or mesquite beans; (2) a locally abundant food, such as shellfish; and (3) incipient agriculture producing a small harvest" (p. 138).

III. Semi-Sedentary. "A community, which can be identified with a village, that establishes itself in successive locations, occupying each for a period of years. The population is stable and continuously sedentary, but able to be so only by moving the village periodically (p. 140)." The technology at this stage of development is characterized by "simple, exploitive agriculture in areas of average to poor natural soil fertility. In the absence of restorative techniques to maintain productivity, or because of the perishable nature of the crops, no surplus can be relied upon indefinitely from the same fields or held against future needs" (p. 140).

IV. Simple Nuclear Centered. "A primitive center, with or without satellites. The center may be a self-supporting town, or a market or ceremonial place that serves as a focus for surrounding villages or hamlets. The center is not strikingly differentiated in content from its satellites except when its character is primarily ceremonial" (p. 141). The technology at this level is characterized by "agricultural techniques adapted to the local environment, so that the effect is conservational. Cultivated plants become the primary food source, reducing the per capita area needed for subsistence maintenance or providing a dependable surplus effective to release a portion of the community from the role of primary producers" (p. 141).

V. Advanced Nuclear Centered. "A community of homogeneous tradition differentiated into an administrative center and satellites consisting of villages, hamlets, and scattered homesteads" (p. 143). Beardsley et al suggest the technology may not be the primary factor in differentiating this level from the preceding level: "This type of community differs more in degree than in type from the preceding one. It probably develops from the Simple Nuclear Center as agricultural techniques improve and are able to provide larger surpluses.

These increasingly come under the control of the upper classes. As the elite become stabilized, it is less affected by public opinion and the main deterrent to private accumulation of wealth is removed. What was essentially voluntary integration on the Simple level becomes more administrative and coercive on the Advanced level" (p. 143-144).

VI. Simple Supra-Nuclear Integrated. (The word "Simple" has been added to this heading to differentiate it, as Beardsley et al suggested, from the "Advanced" stage characteristic of industrial societies.) "A community that integrates nuclear centers and other formerly independent units of heterogeneous tradition, typically by conquest and subjugation" (p. 145). This stage of development is characterized by a technological superiority to wage warfare and/or more intensive food production: Conquest may be promoted by the increasing requirements of food, commodities, or raw materials for maintenance of the administrative or ceremonial superstructure, or the economic system in excess of what the members of the expanding Advance Nuclear Centered community can supply. . . Or, the ability to maintain the enlarged administrative and military structures required for territorial expansion may be considered as an expression of more intensive food production, which places a burden of subsistence provision on a smaller percentage of the population and frees large numbers of peoples for other tasks" (p. 145).

VII. Advanced Supra-Nuclear Integrated. (A description of the community pattern and technology for this stage is supplied for purposes of this paper.) A community that integrates nuclear centers and their satellites into a single, nationally homogeneous tradition, typically by political and economic interdependency. The technology at this stage of development is characterized by an increasing dependency upon the use of fuels and a high concentration of productive equipment in areas adjacent to raw materials and/or primary routes of communication.

It will be necessary to return to further discussion of these classes when we attempt to relate the classes of culture to the classes of education. First we must establish a typology of education.

A Classification of Education

The method of devising a classification of education will be to treat each variable as if the range of the variable was limited to two polar types, that is, each variable is classified as either A or non-A. While it is almost certain that most of the phenomena in the universe do not come in nice either/or categories it is often more economical, especially in exploratory stages, to define the categories so as to exclude the middle range. The next step is to establish at least two sets of variables of the phenomena under consideration which, at least in theory, vary independently of each other. The classification of the study of culture given above is an example of this type of classification. The minimum number of classes established by this method is four when two variables are used; the maximum number of classifications is 2^N, where N equals the number of variables. One should use as few variables as possible to establish an adequate classification. An adequate classification is achieved when the classificatory scheme renders the data intelligible.

A classification of education useful to an evolutionary framework must be based upon criteria which would reflect differential levels of progress development. Durkheim (1933) noted that a developmental scale for the division of labor within a society was characterized by an increase in the number of occupations and greater specialization of activity. This particular phenomena has been generalized into the statement that cultural evolution is characterized by an increasing differentiation of structure and greater specialization of function (White: 1959: 142-204). The question is: What are the indications of increasing structural differentiation and greater functional specialization in education? One possible answer to this question is that changes in structure and function in education will be manifest by (1) who is taught, (2) who teaches, and (3) what is the goal of the education.

Who Is Taught? The two-fold classification of this characteristic is as follows: All individuals are taught or some individuals are taught. It must be understood, however, that "all individuals" refers to individuals in a given age and sex category, and some individuals refers to less than all individuals in a given age and sex category.

Who Teaches? The two-fold classification used here is as follows: Someone who occupies a position of "teacher" in a given setting or someone who does not occupy a position of "teacher" in a particular setting. These two classifications will be abbreviated simply as teacher and non-teacher. It is assumed that in some cultures there will be no specific position, on a spare time, part time, or full time basis, designated as "teacher." In other cultures such a position will be designated, even though this position may be filled on a spare time, part time, or full time basis. It is further assumed that where there is a position of "teacher" there will also be a position of "student." Whether or not a teacher position is specified may depend exclusively upon the setting. For example, a man teaching his son to build a bird house would not occupy in that setting a teacher position; in a setting where the same man was teaching a course and his son was taking the course, a teacher position would be specified. Another example, a plumber teaching his helper to be a plumber does not occupy a teacher position; the same man teaching plumbing in a trade school occupies a teacher position.

Goal of the Education. The two-fold classification of this characteristic is as follows: The goal of education is to equip the individual to occupy a specific position in his society or to occupy a general position in his society.

A specific position is one which is not only differentiated from other structural aspects of the society, but which also has a specialized function vis-a-viz the rest of the society. Individuals who occupy special positions in a society are often set apart by certain rights and responsibility, as well as such factors as manners of conduct, dress, insignias and so on. Examples of special positions are chief, warrior, priest, blacksmith, and trader. As indicated by these examples, special positions are primarily, if not exclusively, occupational specializations. Also, this characteristic of education overlaps with the one above, "who teaches," since the position of teacher is also an occupational speciality. However, it will be shown that these two characteristics of education vary independently; the goal of education to create special positions may be present in the absence of teachers, and teachers may be present in the absence of education to create special positions. The relevance of the teacher position for differentiating various educational types would seem to justify taking this one occupational speciality and treating it as a separate characteristic of education. Finally, the goal of education to create occupational specialists does not imply that only "some individuals" are given education toward these goals. It will be shown that in some societies "all individuals" of a given age and sex category are given the same education to prepare them to occupy the same specialized position, e.g., warrior. The way in which this differs from a general position can be made clear by a discussion of the goal of education to equip an individual to occupy a general position.

A general position is one occupied by an individual in the society-at-large. The goal of the teaching is to transmit social manners, folkways, mores, values, beliefs, etc. which are manifest in the total society or in some identifiable social group -- ethnic, religious, racial, social class, caste, etc. -- of the total society. Examples are adult male, citizen, father, and taxpayer for general position in the total society, and Irish, Jew, Negro, lord, and untouchable for general positions in social groups within the total society. Where the goal of the teaching is to equip individuals for positions in the total society, then "all individuals" are educated. Where the goal is to equip individuals to occupy a position in some identifiable social group within the total society, then "some individuals" are educated. Thus, "who is educated" varies independently with the goal to equip individuals for general positions in the society-at-large, but necessarily is dependent upon whether this goal refers to the total society or some social group within the total society.

Assuming each of these three characteristics of "education" -- who is taught, who teaches, and the goal of the education -- vary independently of each other, it is possible to set up a typology of eight nominal types of "education." These eight types, given in the order that anticipates their order of discussion in the following section, are as follows:

1. Non-teacher -- all individuals -- general
2. Non-teacher -- some individuals -- special
3. Non-teacher -- all individuals -- special
4. Non-teacher -- some individuals -- general
5. Teacher -- some individuals -- general
6. Teadher --some individuals -- special
7. Teacher -- all individuals -- special
8. Teacher -- all individuals -- general

We are now in a position to attempt to relate the types of education to the various levels of cultural evolution.

The Evolution of Education

The procedure in this section will be to return to a more detailed description of each of the cultural stages described by Beardsley and others.

I shall then indicate which type or types of education would occur at each cultural level and briefly give a justification making this assertion. Often the relationship between a cultural level and educational types is logically clear from the description of the cultural level: If there are no specialists and all individuals are members of the same types of social segments, then there are no teachers, and all students must receive and education to equip them for general positions in the total society. However, the situation is not always as clear-cut as this, in which case I shall resort to information about specific cultures, examples of which are supplied in the monograph of Beardsley *et al* and elsewhere. The relationships and propositions established by this method are obviously tentative; establishing these relationships upon a firm empirical basis is the task of a more extensive project of which this is the initial and exploratory effort.

The various cultural levels will be discussed in the same order as they were given in the section "A Classification of Cultures." The relationship between types of cultures and types of education is summarized in Table 1.

I. *Restricted Wandering*. At this level we find the basic social concrete structure to be the nuclear or extended family which may, at least for part of the year, be combined into bands. If there is a leader of the band, he has no coercive power. There may be minimal status differences or none at all. "Puberty rites or other group ceremonies may be absent, sporadic, or well developed" (Beardsley *et al*, 1956:137). The only specialist, who may or may not be present, is the shaman. At this level of cultural development, there is no teacher position present, all individuals are taught some of the things they need for participation in the total society and, with one possible exception, the goal of education is general. The possible exception is that the position

Table 1

Type of Culture	Type of Education Non-Teacher All Individuals General 1	Non-Teacher Some Individuals Special 2	Non-Teacher All Individuals Special 3	Non-Teacher Some Individuals General 4	Teacher Some Individuals Special 5	Teacher Some Individuals Special 6	Teacher All Individuals Special 7	Teacher All Individuals General 8
I. Restricted Wandering	X	X?						
II. Central-Based Wandering	X	X						
III. Semi-Permanent Sedentary	X	X	X					
IV. Simple Nuclear Centered	X	X	X	X				
V. Advanced Nuclear Centered	X	X	X	X	X	X		
VI. Simple Supra-Nuclear Integrated	X	X		X	X	X	X	
VII. Advanced Supra-Nuclear Integrated	X	X		X	X	X	X	X

of shaman may be a special position that is learned. However, the presence of a shaman does not necessarily indicate that some individuals are taught to be shamans. At least in some cultures at this level all individuals in a society have shamanistic knowledge, but some individuals because of special visions or other factors tend to activate and emphasize this knowledge. In the event that shamanistic knowledge is taught as a speciality to some individuals through an apprenticeship with the shaman, then a second type of education would be found at this cultural level. Since it is uncertain whether or not this occurs, I have indicated this on the table by adding a question mark in the appropriate cell. Thus, Type (1) *non-teacher--all individuals--general*, education occurs at this cultural level. Type (1) education occurs in, at a minimum, the social concrete structure we refer to as the family. It is assumed that education, as it is defined in this paper, takes place in all families, whether it is teaching a boy to shoot a bow or drive a car. Since the family is universal in all cultures, we would argue that this type of education is found in all cultures at all cultural levels. Type (2) *non-teacher--some individuals-- special*, if it does not occur at this level of culture development, almost certainly occurs at the next level of cultural development. Type (2) education also occurs in the most advanced cultural level (Advanced Supra-Nuclear Integrated) level of cultural development, for example, the apprentice-master relationship which may prepare a student for special positions such as plumber or movie director. Type (2) education seems to occur from the second level of cultural development to the most advanced.

II. *Central-Based Wandering*. This cultural level, except in mobility pattern, is very little different from the preceding level; and in fact, most classifications do not distinguish between these two levels. As in the preceding level, there is no occupational division of labor "although certain families may have hereditary preeminence in crafts that are practiced to some degree by all" (Beardsley et al, 1956:130). However, based upon information of some of the ethnographic examples cited by Beardsley et al, e.g., the Eskimo, at least the position of shaman seems to be a specialty that one must learn. For this reason we have attributed Type (2) education to this level without any question.

III. Semi-Permanent Sedentary. The sexual division of labor is clearly marked at this level of cultural development. "Village or tribal specialization in the manufacture of caramics, basketry, manioc graters, or similar products occurs, with consequent regulation of trade relations. Within a community some individuals may be recognized as superior craftsmen, but their creations are rarely considered preferable for daily use. The basic skills involved in weaving, pottery making, and other crafts are known to all. . .Clans and/or moieties are typical. . ., although extended family organization is also relatively frequent at this level. Some individual is usually designated as the head man or chief, but his powers depend more upon his personal qualities than upon status vested in the office. . .Social differentiation ranges from incipient to well developed, with warfare and shamanism the primary means of acquiring prestige. . .Group ceremonies, featuring masked dancers and 'folk drama,' are held to promote success in agriculture and other food quests important to the community as well as puberty and other events in the life cycle. Shamans are characteristic, and sometimes wield considerable power by virtue of their connections with the spirit world" (Beardsley et al, 1956:140-141). Another social segmentation found at this level of cultural development, although not mentioned in the description, is age-graded societies (see Eisenstadt, 1956). Type (1) education is found at this level associated with the concrete social unit, the family. However, Type (1) education is also presently associated with other concrete units such as the clan and moiety. Within the clan or moiety setting, Type (1) education takes on two further aspects which differ from the family setting. First, education for the first time becomes somewhat formal in that it is often associated with ceremony and ritual, and the termination of the period of education is usually marked by acceptance of the newly initiated individual into the clan. Second, for the first time individuals are segregated into educational groups; that is, an individual is taught the ritual, ceremonies, customs, rights and obligations of his particular clan or moiety. However, the goal of education is the same for all individuals regardless of clan affiliation, and the difference in content is certainly qualitatively less than the difference between a college and non-college curriculum in a modern high school. The process of education is the responsibility of a priest or community elder who occupies that position and not the differentiated position of a teacher. While education in the clan setting has been typed with education in the family setting, it seems important to point out that this difference in setting anticipates changes in education which become increasingly important at higher levels of cultural development.

Some puberty rites, although not all puberty rites as Hart (1963) indicates, found at this level of cultural development are also classified as Type (1) education. Many puberty rites, of which the female puberty rite of the Jicarilla Apache is an example, do not involve education as defined in this paper; these are rituals marking the transition of a change of status for an individual and his relations. No new knowledge, skills, or information are transmitted during these rituals. The knowledge necessary to occupy the new status is something the individual has learned since early childhood.

The individual is not told how to do something, he is now expected to do it as part of the requirement of the new status. However, other puberty rites do transmit to the individual knowledge, information, or skills not formerly known, and these puberty rites fall into Type (1) education.

Type (3) non-teacher--all individuals--special, education is introduced at this level of cultural development with the presence of formal age-graded associations or with formal military associations whether age-graded or not. Military associations and many formal age-graded associations serve the purpose of training "all individuals," that is, all males of a given age, to occupy the "special" position of warrior. That this is a special position and not a general position in the total society is demonstrated by the special skills and knowledge learned by the warrior class, by the fact the warriors are often set apart in special houses or clubs, and by the rights and obligations attributed to the warriors but denied non-warriors (e.g., the warriors may be excused from normal adult male productive activity, but are not allowed to marry). We would expect all adult males to be warriors if this were a general position in the total society. Such is not the case. After a specified period as a warrior, the adult male ceases to occupy this position and advances to the general position of adult male participating in normal productive activity, acquiring a wife and children, and so on. An individual learns the warrior position by participation with and instruction from those in the advanced age-grades or who already occupy the warrior positions. No position of "teacher" is associated with this training.

I know of no other example of Type (3) education. It is found in Type (IV) cultures and probably in Type (V) cultures; it is not found at higher levels of cultural development. However, the obvious modern decendent of this type of education is universal conscription for military training.

In summary, several important advances are made in education at the third level of cultural development. First, Type (1) education is associated with concrete groups other than the family, it takes on some formal aspects, and individuals are segregated for purposes of education. Second, Type (3) education emerges at this level; it disappears at higher levels of cultural development to be replaced by another type of education which will be discussed below.

IV. Simple Nuclear Centered. At this cultural level "full-time occupational specialization is characteristic of some part of the population, either in administration, ceremonialism, or technology. These specialties typically are hereditary. . .Kinship-based organization continues to be important, but is overlaid to some extent by differential status within or between families. Incipient to well-developed social stratification is correlated with an increase of ascribed over achieved status. The chief acts to some extent in his own interest or the interest of his class, and usually has power to coerce subjects, particularly as individuals or as members of the lower class. His power is related to the size and distinctiveness of the upper class, however, and where the social stratification is minimal, the chief's role is little different from what it is in Semi-Permanent Sedentary communities. . .Religion is formalized and externalized in temples, ritual, prayers, and offerings. . .Both increase in community size and specialization of religious ritual seems to be responsible for the allocation of part of the community to an audience role rather than the participation characteristic in Semi-Permanent Sedentary and in Wandering Groups" (Beardsley et al, 1956:142). Specializations are clearly evident at this level expecially in terms of occupations, administration, and religion. However, indications are that the specialization is still of an apprentice-master form, Type (2) education. Also clearly evident is that social stratification is now developed to the point that different social manners, beliefs, attitudes, skills, and so on must be taught to members of each distinct social class. We assume that this involves Type (4) non-teacher--some individuals--general, education. This type of education is characteristically carried out in the social concrete unit we refer to as the family. Such education is in addition to Type (1) education, which is also carried out within the family. However, it is probable that Type (4) education is also carried out at other cultural levels in some social concrete units other than the family. Type (4) education will be found in societies that have social classes, ethnic groups, castes, racial minorities, and so on. More simply, Type (4) education will be found in any society that is socially stratified. Thus, we attribute Type (4) education to every level above the Simple Nuclear Centered Stage of cultural development. An example of Type (4) education in an Advanced Supra-Nuclear Integrated culture is the type of education a Negro child living in the southeastern part of the United States would receive. The teachers would be parents or non-teachers, only Negro children or some individuals would be taught, and the goal of the education would be general, equipping the child for adjustment to the society-at-large rather than to occupy a specific position.

V. Advanced Nuclear Centered. At this level of cultural development "surplus production, expecially of food, may be acquired by the ruling class in the form of taxes, which seem to make their appearance at this stage. Well-developed specialization decreases family self-sufficiency, and to the degree that goods must be acquired from others, distinctions in wealth and property are more pronounced. "Earning" a living becomes possible for occupational specialists, an ability to devote full time to learning a craft results in proficiency and technological improvement. Public and temple granaries, filled by taxes, permit the priest or rulers to support labor for large-scale construction and to maintain a large body of retainers. . .Administration is carried out by the hierarchy of officials typically headed by a chief or king. Government assumes the task of social integration, law and politics supplanting kinship as the dominant regulator of interpersonal relations. Social classes are distinguished by dress and have different rights and privileges. . .Education is confined to members of the upper class, and typically dispensed in the temples. . .Hierarchical ranking of priests parallels the civil administrative hierarchy. . .The priesthood is a depository of wealth and power" (Beardsley *et al*, 1956:144). Two different types of education make their appearance at this stage of cultural development. First, Type (5) *teacher--some individuals--general*, makes its appearance when the general education of the upper class is turned over to specialized teachers in the temples. Also, Type (6) *teacher--some individuals--special*, education makes its appearance with individuals devoting full time to learning occupational specialities. Presumably, some individuals devote full or part time to teaching these occupational specialties. Both of these types of education are found at the most advanced level of cultural development. Examples for the modern society of the United States are Groton for Type (5) and East Chicago Welding School for Type (6).

VI. *Simple Supra-Nuclear Integrated.* This cultural level is characterized by large scale commerce. "Commercial attitudes are prevalent, and indebtedness may be punished by slavery. Wealth is accumulated in goods, land, or slaves. . . Goods, land, services, and even people are bought and sold. . .Administrative procedure is similar to that developed in Advanced Nuclear Centered communities. The major addition is military organization, frequently including a standing army, for international policing as well as external expansion. The ruler may be identified with the gods and wield absolute power with divine sanction.

At the opposite extreme in the social hierarchy is a large lower class with a minimum of prerogatives, if not actually reduced to slavery or serfdom. . . The religion of the conqueror frequently becomes the state religion and is imposed upon conquered groups. . . However, with the growth of scientific knowledge, supranaturalism tends to change from a coercive force to an ethical standard and ceases to be a major mechanism of social control" (Beardsley et al, 1956:146). Type (7) teacher--all individuals-special, education seems to be introduced at this cultural level. One need for Type (7) education stems from the fact that at this stage of cultural development standing armies are present, usually with universal conscription for all individuals of a particular age and sex category. An example of Type (7) education in the modern society of the U. S. is universal conscription for military training.

VII. Advanced Supra-Nuclear Integrated. This stage of cultural development is characterized by a high degree of industrialization and occupational specialization. Occupational specialization reaches the point where it becomes the major criterion for determining social class, income, and other social characteristics. The use of relatively untrained slaves and serfs becomes highly unprofitable at the most advanced stages of this level. There is a proliferation of associations, especially voluntary associations. Social classes are less distinct than in earlier stages and social mobility is relatively easy. The population, initially derived from the heterogeneous segments brought together in the previous stages of development, are now welded into a social and political unit to the degree that internal coercion is infrequent or absent. The state increasingly becomes concerned for the welfare of the general population and for long term planning of social change. Individuals who are not trained in any specialization or who lack the background to become so trained are considered a liability to the society. Type (8) teacher--all individuals--general, education is characteristic of this level of cultural development. A great deal of the education at this level is carried out by individuals who occupy a teacher position in the society; all individuals in the society, including in some cases both sexes of a particular age category, are educated; and the education considered to be of a general type to equip the student with knowledge and skills for participation in the society-at-large. Type (6) education is usually associated with a social concrete structure which we call the public school. These schools are supported by the society-at-large, and all students theoretically have a right, in many cases an obligation, to attend these schools for a certain period of time. Since this type of education is the primary interest of this paper, further discussion of Type (6) education will be reserved for a subsequent section.

A general overview of the foregoing attempt to relate types of education to levels of cultural development indicates there is some relationship between types of education and level of cultural development. The scale we have developed here is meant to serve as a model for further research, and there is no claim that it has been empirically validated. It is quite likely that a careful, detailed study of the ethnographic materials will indicate that some of the types of education developed either earlier or later than the stage with which we have associated it. Also, it may be necessary to change the general order in which some of the types of education have developed. Our task, however, is to see what this developmental scheme, regardless of how imperfect, contributes to our understanding of the nature of education.

A General Discussion

The criteria for establishing types of education were selected on the basis of their ability to reflect increasing structural differentiation and functional specialization. Thus, the position of "teacher" becomes differentiated as a distinct and separate position, individuals become differentiated into distinct and separate educational groups, and the goal of education is differentiated into distinct and separate goals of equipping individuals to occupy special positions in the society. If increasing differentiation occurs in the developmental sequence, then we would expect the least differentiated forms of education to be found at the lowest level of cultural development. This does, in fact, occur where Type (1) education non-teacher--all individuals--general, is found at the first level of cultural development. Conversely, we would expect the most differentiated type of education, teacher--some individuals--special to be found at the highest level of cultural development and to be the last type of education to have evolved. This is not the case. The most differentiated type of education, Type (6), is found at the fifth level of cultural development, and the last type of education to evolve was Type (8) teacher--all students--general, which differs from Type (1) only in the differentiation of the position of teacher. Several points are highlighted by this discrepancy.

First, modern evolutionary theory takes the position that it is cultures and not sub-systems of the cultures which manifest a unilinear sequence from the least differentiated to the most differentiated. The failure to make this distinction was one of the shortcomings of Nineteenth Century cultural evolutionary theory. Since monogamous marriage was the form found in what was considered to be the highest evolved form of culture, i.e., Nineteenth Century Western society, then the type of marriage found in the least developed societies would be group marriage or the promiscuous horde. The same reasoning was applied to language, kinship systems, economics, and so on. Murdock (1949: 184-259) has shown that kinship systems evolve in a number of lines, Service

(1960) has shown that while kinship systems do not evolve that systems of relations do, and Greenberg (1959) has shown that systems of communication evolve although natural languages do not. This does not mean that sub-systems of a culture do not change both in structure and function as the total culture evolves; it simply means that changes in these sub-systems are relative to changes in the total cultural system. This discovery should not be surprising in light of the fact that differential change in sub-systems of the biological organisms of an evolving species is commonplace (cf. Washburn, 1951). In short, the type of education found at a given level of cultural devdopment is the type appropriate to that level and no more.

The second point apparent from this discrepancy is that emergent types of education do not always replace the antecedent forms from which they arise. In fact, the tendency seems to be for a type of education to persist once it has developed, and there is only one case where one type of education, Type (3) is actually replaced by another type -- Type (7). It is quite apparent, however, that the concrete unit with which a given type of education is associated at one level of cultural development may be associated with another type of concrete unit at another level of cultural development. Also, the specific content of a given type of education may change from one cultural level to another. What our evolutionary scheme of education does tell us is that once a type of education, that is to say, a type of social relationship involving the transmission of culture, has emerged, it is usually retained. This factor provides a second interpretation of structural differentiation; that is, education becomes more differentiated with higher evolutionary stages in that more types of education are found at higher levels than at lower levels. Thus, each level of cultural evolution, beginning with the first, is characterized by an increase in the number of types of education. The possible exception to this is levels I and II. Therefore, the educational system as a whole does become more differentiated by an increase in the number of types of education.

If education becomes progressively structurally differentiated, then it would logically follow that it also becomes more functionally specialized. The supporting argument for this statement has been presented, in part, in our discussion relating types of education to levels of cultural development. However, all this argument says is that a type of education found at a given cultural level will be functional for that level of culture; and this is one of the premises upon which this study is based. The important question concerns the functional requisites at a given level of culture which would make a particular type of education necessary for that culture to exist. Space and time do not allow me to take up this question for each of the seven cultural levels. In light of this, and because other papers in this volume are primarily concerned with education in cultures at level VII, I shall briefly discuss the functional requisitesof a culture at level VII which necessitates education Type (C).

The Public School: An Evolutionary Perspective

Our discussion of the functional requisite status of Type (C) education for level VII will proceed as follows: There is a functional relationship between technology and some types of education; cultures at level VII are characterized by both a high degree of technological development and a rapid rate of technological change; cultures at level VII are characterized by both a large number of occupational specialists and a high degree of specialization; the functional requirement for both a large number of specialists and a high degree of specialization are met by a given type of education; that type of education which provides both a large number of specialists and a high degree of specialization is, paradoxically, a general (non-special) education for all individuals, Type (C); the general or non-special nature of Type (C) education is derived, however, from a composite of a number of specialties.

Without question the most distinguishing characteristic of cultural level VII is the extent of the technology and the rate at which technology changes. It would be strange indeed if these two factors were not reflected in the educational types of societies at level VII (cf. Clark, 1962). There are two ways in which technology may be related to education. First, some types of education presuppose a certain level of technological development. At the very minimum, the technology must be developed to a level of efficiency which provides for some individuals in the culture to spend at least part of their time in the positions of teacher and student rather than in immediate productive effort. Thus, it is only at level V of cultural development that the position of teacher appears. At the most advanced level of cultural development, VII, we find a large number of people occupying a teacher position on a full time basis and ideally all individuals at some period occupying a full time position of student. It is perhaps obvious that this is possible only in a culture with a high level of technological efficiency. The second way in which technology may be directly related to education is when education is for the specific purpose of implementing the technology. We shall argue that this is one of the major characteristics, although not the only characteristic, of modern education.

Most of man's existance has been marked by a long period when there were few cultural changes, and these were of a relatively minor type. During the first 500,000 years or more, culture did not advance beyond level II. About 10,000 years ago changes were set in motion that advanced culture from level II to level VII. During this period, those cultures -- Egyptian, Grecian, Roman, Mayan, and so on -- at the forefront of cultural advancement at a given period were marked by many cultural changes of a relatively major type. Not only have these changes been rapid and major, but insofar as they can be measured by technological changes they seem to increase at a rate more nearly approaching a geometrical then an arithmetical function (cf. Kroeber, 1952:49-51). This is the basis for the commonplace observation that cultures at level VII are characterized by a high degree of technological development and technological change.

The technology of cultures of level VII is associated with societies with both a large number and high degree of occupational specializations. Occupational specialization, in fact, seems to characterize societies at this level. Individuals occupying positions requiring a high degree of specialization are rewarded with greater social prestige and wealth than those individuals occupying positions requiring relatively less specialization. Probably the best single index of an individual's rank in a modern society is his occupation, which in turn largely depends upon the degree of specialization of that occupation. The way in which an individual becomes specialized is through education. Thus, level of education, degree of occupational specialization, social rank, and so on are generally associated in societies at cultural level VII. Further, relationships between education, specialization, and technology in level VII cultures is illustrated by the tendency to rank these cultures in terms of technological development and to look to education as the key to technological superiority.

What types of educational problems are created by a highly developed and rapidly changing technology. First, many different types of specialists are needed. The number of different types is so large that it would be virtually impossible to set up specialized schools to train individuals for each of these positions, even if it could be anticipated in advance the number of individuals needed for these positions and which of the individuals in the society would best be suited to fill these positions. Second, skills and knowledge essential to the culture at one period of time may be virtually obsolete in the next generation, e.g., the blacksmith. Third, skills and knowledge not needed at one period of time become virtual necessities in the next generation. And, fourth, new skills and knowledge develop which were not present in the previous generation but which must be transmitted to the contemporary generation. In order to see how these educational problems, or functional requirements, are met, we shall turn to a consideration of the type of education uniquely associated with level VII cultures.

In spite of the emphasis placed upon the number and degree of specialization, the type of education which characterizes level VII cultures is considered to be general, and it has been so classified in this paper, Type (8). This education is so general, in fact, that it is given to all individuals in the society of a certain age regardless of race, religion, sex, or any other characteristic short of physiological inability to acquire this education. Individuals are not considered to be fully capable of operating in the culture until they have acquired this education, and in most states it is required by law that an individual at least continue to attempt to acquire this education until he reaches a certain age. While there can be little doubt that education of Type (8) characteristic of modern cultures is generalized, the generalized nature of this education bears further consideration.

We noted in the preceding section that education Type (8) (teacher--all individuals--general) is directly derived from education Type (7) (teacher--all individuals--special). The question is simply how do we get from special education to non-special education. Let us suppose that all students were given a special education in the native language of a culture by a specialist in in that language. This is the only specialty taught to all the students. The students are not taught to the degree that they themselves become specialists in the language, but to the degree that they may occupy positions which require a certain facility in the language. Add to this a special education to the same level of proficiency in mathematics taught by a specialist in mathematics. Further add to this the same type of special education in the biological sciences, the physical sciences, the social sciences, history, languages foreign to that culture, art, music, and so on. The sum of these special educations would make up the core curriculum of a secondary school in the United States. The general nature of an education made up of a number of specialties is derived from two facts. First, as already noted, this education is general to the extent that all members of the culture are expected to acquire a certain level of proficiency (or specialization) in each of these specialties in order to become a fully functioning member of the society. Second, this education is considered to be general in the sense that the students do not reach the same level of proficiency (or specialization) as their teachers. However, specialization is a matter of degree. To illustrate this point imagine a 1965 high school graduate at a convention of 10th century scholars. Not only could he hold his own with this group, but he could tell them a thing or two about the structure of language, the nature of atoms, organic evolution, the circulation of the blood, the laws of motion, the geographical determinants of population density, the relationship between the earth and the sun, and so on. On the one hand we are simply saying that the amount of knowledge has greatly increased in the last 1000 years. On the other hand, and this is our point, we are saying that all members of level VII cultures have become relatively specialized in a large number of areas.

Not only is modern education characterized by special education in a number of different areas, but there is evidence that the degree of specialization is increasing. The evidence I can supply here applies only to public education in the United States. In the last 50 years there has been a trend away from the one teacher who taught everything to a number of teachers teaching special subjects. Specialization of subject matter first began in the last three years of school. Then it was extended to the last five years of school with the development of the junior high school. Within the last 25 years another year of school was added at the terminal year of the education so that special education extends through four years of secondary school and two years of junior high school or through one-half of the public school education. Also, there has been an increasing tendency to use specialists in the first six grades. This apparently began with art and music teachers and is now being extended to include teachers of foreign languages and, in some cases, mathematics. Where specialists are in short supply, their effectiveness is extended by the use of television, phonograph records, radio, and so on. Added to this is the search for more effective teaching methods, therefore making it possible to acquire a higher degree of specialization in the same amount of time. Finally, there is an interest in probing the limitations of the students, especially to see if they cannot acquire skills, information, and knowledge at an earlier age so that specialized subjects can begin earlier and advanced further before the end of the public school period. The argument may be advanced that all of this is necessary because of the increasingly greater amount of knowledge to be transmitted. However, this argument asks the question rather than answers it: Why is it necessary to transmit to all of the individuals this great bulk of knowledge? The answer to this question brings us back to the functional requisite nature of Type (3) education to cultural level VII.

Type (3) education gives all members of the society an education in as many specialties as possible and to the highest degree of specialization possible within the limited time of the 12 years of public education. This type of education solves the problem of having to train people for a wide variety of specializations. A student with a secondary education is in a position to specialize as a service station attendant in a few days or as a psychiatrist in a few years. This means also that a great deal of education may be wasted insofar as it applies to the special position the individual will occupy; e.g., the courses in biological sciences taken by the service station attendant. This type of education solves the problem of teaching skills and knowledge which may no longer be needed. A boy who becomes a coal miner at the age of 12 is little suited for any other position as an adult; on the other hand, having a high school education does not preclude one from becoming a coal miner. This type of education also provides a basis for learning new skills and knowledge which have not been anticipated. A high school education provides the foundation for one to become an electronic technician even though this position did not exist during the period of high school education. Finally, this type of education provides for the transmission of new skills and knowledge to the contemporary generation. The teachers, being specialists, are in a position to be aware of the most recent developments in their areas of specialization. Thus one generation may be learning a foreign language by techniques which have been developed since the last generation of students. Type (3) education, a general education made up of a number of specialties, then, has effectively met the requirements of level VII cultures.

So effectively has this type of education met these requirements that most of the present trends, as noted above, indicate a continuing expansion and accentuation of this type of education. This trend conforms to what Hockett and Ascher (1964:72) have called "Romer's Rule": "The initial survival value of a favorable innovation is conservative, in that it renders possible the maintenance of a traditional way of life in the face of changed circumstances." While the intent of Romer's Rule is to explain something about the adaptations made by biological species, it seems to describe adequately the present situation in education: increasingly earlier specialization of subject matter in the public school with teachers increasingly specialized in their subject matter. However, from what we know of the evolution of culture, it appears likely that quantitative changes in education Type (2) will not continue to meet the functional requisites of a rapidly changing culture. What are the prospects for education in the culture of the future?

We can make only some suggestions here about the future course of education. First, a negative conclusion: education will not be of one of the eight types discussed before. Our definition included two elements (1) interaction between two or more individuals, and (2) the purposeful transmission of culture. We suggest that the second element of this definition must remain, i.e., that culture must be purposefully transmitted in all cultures if they are to survive more than one generation. The first element of education may very well be dropped out. In the earlier pages of this paper it was argued that "interaction" between two actors would be extended to include books, televised lectures, etc. There was an awareness in this argument that this kind of interaction was somehow of a different order than "a student sitting on one end of a log and the teacher on the other end of the log." This trend toward the depersonalization of education will be accelerated; we can envision a time when most of the academic things taught in the public school can more effectively be taught by "teaching machines," although they would be much more sophisticated than the crude machines now in use. It is not impossible that each home will have such a machine, just as most homes now have television sets, and that a student will order or have sent to him the "tapes" necessary for his particular stage of education. The public school as an institution including children and teachers will no longer exist. Those non-academic subjects taught in the public school -- group interaction, citizenship, etc. -- will be taught in the family, peer group, church, organized play groups, etc. After a period during which there will be attempts to have all children follow the same sequence of courses and at roughly the same rate, there will follow a plan to let each child proceed at his own rate and follow, within broad limits, those subjects which interest him most. The entire element of education "non-teacher--teacher" will drop from our classification, since interaction between individuals is no longer a part of this type of education, and only the elements "general--specific" and "some individuals--all individuals" will remain. As indicated above, the trend will be from "general--all individuals," as we attempt to preserve the former system, to "specific--some individuals" when the new system is evolved.

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CHAPTER III

CULTURAL EVOLUTION AND EDUCATIONAL FEEDBACK

Paul F. Green

The conditions under which a type of education emerges can be attributed to the level of cultural development among a limited set of factors that characterize any society as a culture type. It is reasonable to assume that the relationships between a type of education and specific culture types at various levels of evolution are logically ordered but not simple. It is the burden of this paper to formulate generalizations about these relationships and thereby explain the evolution of certain types of education.

It is clear that the choice of factors with which one describes the level of cultural development may either obscure or clarify relationships with types of education or other social institutions. Various schemata have been proposed for classifying cultures, of which perhaps the most general (that of Beardsley et al, 1956) is based primarily on the type of community settlement pattern associated with a culture. It will be argued here that the classification of cultures in terms of settlement patterns constitutes a classification in terms of dependent variables rather than in terms of independent variables which produce differences among the evolutionary stages of culture. It is assumed that a dependent variable classification system will prove useful for examining those factors with which it is directly associated, but will tend to obscure the examination of other types of dependent variables. It is suggested then that community settlement pattern does not predict directly to a type of education.

It is here proposed that cultures be classified for evolutionary analysis in terms of two independent variable factors: technology and natural environment. The theoretical rationale is that the subsistence level of any culture complex is the combined product of technology and environment and that an increase in the subsistence level of a culture complex is a pre-requisite (antecedent condition) for its cultural evolution. It will be shown that with these factors one can generate a more complex set of culture types than can Beardsley _et al_. The implications of this typology will be examined for each of four dependent variable fields: (1) community settlement patterns, (2) ideological patterns, (3) sociopolitical patterns, and their implications in turn for (4) type of education. The first three dependent variable fields are discussed for their proposed conditioning of the type of education predicted to emerge in connection with a prevailing subsistence pattern.

Finally, it is suggested here that education must be viewed both as a resultant of the level of cultural development in a given society _and_ as a factor promoting further evolution within the society. Education thus can be characterized as a feedback mechanism which, where the environmental bases of a culture complex will permit, either provides the necessary cultural elaboration to meet the subsistence requirements of a population, or provides the innovation necessary for cultural progress. In short, education is here conceived as both a dependent and a potentially independent variable to cultural evolution. As cultures become more complex, different types of education emerge cumulatively; meanwhile, educational practice becomes progressively (1) more distinct from socialization and (2) more formally institutionalized.

Subsistence Pattern and Cultural Evolution

The theory which underlies this discussion is an essentially simple theory of cultural conflict, but its ramifications are quite complex. Within the limitations on cultural variation established by human and non-human environmental potentials, sustained evolution is restricted to those cultural entities wherein men collectively strive to reduce sociopolitical conflicts by altering their pattern of subsistence. Any effort to resolve sociopolitical conflicts that results in an effective increase in subsistence to an organizational entity (e.g. society), with which men ideologically identify, will tend to advance that cultural entity along the evolutionary scale. Thus, conflicts of corporate interest, international competition, wars, and other cultural crises provide the critical conditions necessary to instigate the evolutionary process. The cumulative process begins where an increase in the level of subsistence provides for an expansion of the population. The stage is then set for a new and characteristic settlement pattern, ideology, and sociopolitical system.

The various modes of dealing with such conflicts and increasing subsistence are the proper subject of a much broader statement on cultural evolution than is envisaged here. It must suffice to say that a classification of cultures in terms of their technology and environment does not explain why cultures, having successfully adapted to an environment at one level, would ever necessarily undergo an alteration of technology or social structure. It is only by man's efforts to resolve conflicts between social organizational units, which threaten one another's resources and relative status, that sustained evolutionary growth can be explained. In the effort to resolve such conflicts, educational institutions may play a crucial role. The survival of a particular cultural entity or complex may depend on whether or not cultural innovation is permitted and encouraged.

No theory of evolution would be complete, however, if it did not consider human nature as an essential factor. Simply stated, man is the creative agent for the symbolic differentiation of cultural objects, activities and ideas. Not only the innovation of technology but also that vast panoply of cultural commonalities and peculiarities among traditions and values can be attributed to this creative and original source of energy. For the purposes of this paper, human nature will be treated as if it were a constant. Hence, a great deal of variation in the cultural phenomena discussed below will remain unexplained. For instance, variations in educational philosophy or pedagogy will be largely untouched, since they are presumably the product of unexplained cultural traditions and value-belief systems manifested by various individuals and groups within a society.

This paper proposes to examine the technological and environmental characteristics of a culture complex as if the combination of these factors determined the structure of other characteristic cultural elements including the community settlement pattern, ideology, sociopolitical structure, and type of education. What follows is a brief review of the treatment of these two factors by previous authors. For the purpose of high-lighting some relevant issues, an overly simple distinction will be drawn between authors having technological or environmental biases.

Various indices of cultural development have been suggested by anthropologists that appear to be based on technology. Those who share the technological bias, can frequently be classified as unilineal evolutionists and can trace their intellectual geneology to such historically legitimate sources as Morgan, Marx, and Durkheim. More modern representatives of the tradition include Leslie White and V. Gordon Childe. In spite of their partially shared theoretical orientations, it is difficult to find a sufficiently general or operational classification of cultural development. Even more difficult is to find a classification scheme which uses a technological criteria as its primary index. For instance, though Beardsley et al suggest a technological basis for the ability of a culture complex to maintain communities of increasing size, the primary criteria utilized is that of community mobility (1956: see pp. 133-134). Childe (1951), who uses the traditional classifications of archeology (Paleolithic, Neolithic...Iron Age, etc.) and places emphasis on different modes of production, nonetheless feels that the only reliable index of cultural progress is the increase in population size and density. However, the seminal discussion of cultural stages in technological terms is undoubtedly that of Lewis Morgan (1963).

Strangely enough, Morgan came as close as anyone has since, in the establishment of an operational culture classification based on technology. Pottery is after all a product of technology associated with subsistence (e.g. food storage, cooking, and manual arts and crafts), and is hence likely to reflect in a very direct way some of the basic developments which differentiate between early levels of cultural development. Morgan's three-fold classification of culture into stages of savagery, barbarism, and civilization represented in a gross but suggestive fashion the basis for Marx's (1906) emphasis on economic relations in society. The production of a surplus product, which allows a minimum of specialization and frees at least one class for ownership and/or control of the means of production in society sets the stage for further developments of culture. The dynamic mainspring in the system for change and growth becomes the conflict between the classes for the control of these means of production.

Yet with all the emphasis placed on technology there has been a well reasoned round of dissent from others who are also interested in cultural evolution. (For purposes of this discussion, those who deny the possibility of studying cultural evolution are excluded from consideration.) A number of these others have proceeded on the assumption that the natural environment acts as the basic conditioning factor in cultural development. Accordingly, even though societies may vary in the sophistication with which they handle their environments, their cultural development must conform in general to certain lawful limits based on fertility of the soil (Meggers, 1954), on temperate vs. tropical climates (Huntington, 1915), or some other subsistence characteristics of the region in which their culture develops.

Among the environmentalists there are two of recent note who can be of use to us in an attempt to develop an evolutionary classification. Julian Steward (1955) explains the integration level of a society in its environment by relating its particular type of socioeconomic adaptation to its particular environmental configuration. He argues that the development of general schemes of classification based on different types of technology are inadequate. Since variations between environments are large, a given type of technology will interact to provide an indeterminate number of culture types. The larger our developmental scheme the less certain we can be that, say an early culture type, will be "representative of a universal early stage, except in characteristics that are so general as to signify nothing concretely about any particular type" (Steward, 1955, p. 25).

Elman Service (1962) has made a useful distinction between Specific Evolution and General Evolution, that clarifies the difference between Steward's position as a multi-lineal evolutionist and the position of unilneal evolutionists such as V. Gordon Childe and Leslie White. Steward, the specific evolutionist, is concerned with the cultural development of specific entities identified with particular cultural areas. Leslie White (1959), the general evolutionist, is concerned with the rise of higher forms or progressive culture types (possesing more sophisticated technologies) aside from any phylogenetic considerations. Although the unilineal perspective is the more appropriate perspective for this study of culture and evolution, Steward's conception of culture types as inseperable from their environment (save analytically) is a potentially valuable addition to the traditional technological bias. The unilineal evolutionists typically endeavor to treat environmental variations or "peculiarities due to differences in habitat" (Childe, 1951, p. 35) as if they could be averaged together to constitute a constant cultural factor.[1]

Unlike Steward, however, our method must be to so generalize natural environments that we can work with a limited number of types, rather than with the specific environment of particular cultures. Betty Meggers (1954) has provided a convenient and useful typology of environments which will serve our needs ably for a beginning. It would be fair to suggest that this paper attempts to partially synthesize the technological orientations of White and Childe with the environmental emphases of Steward and Meggers. The model that is here proposed assumes that general types of technology and environment permit a general classification of progressively higher culture types which largely obviates the problem of specific environmental variations. For the descriptive material provided in both the independent and dependent variable classifications, we have drawn heavily from the work of Beardsley et al (1956) and from Wilson (see Chapter II).

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[1] The implied criticism of Leslie White's treatment of the average environment can be extended to the treatment of human nature in this paper.

As for the theory of culture conflict summarized above, the work of Karl Marx should be credited as the seminal contribution. Among the many evolutionary theorists who share the technological bias, it is remarkable how few have either incorporated or expanded Marx's special theory of social conflict. Among those reviewed in this paper only Childe has made a significant contribution in the Marxian tradition. A modern variation on the role of class conflict and class consciousness in the growth of the economy can be found in the work of Hagen (1958). Hagen theorizes that the economic growth of society depends on the existence of a subordinated group who are conscious of discrimination against them by dominant groups in the society. His law of group subordination is a special theory of intra-societal conflict which fits the general theory of culture conflict outlined above.

The concern with a culture conflict theory of evolutionary growth is intended to challenge the implied theory of traditional unilineal evolution. The designation of culture as superorganic is symtomatic of a theory which places complete faith in a simple model of cultural determinism. Unilineal theory assumes that any improvement in the level of subsistence will be adopted. The increase automatically provides for an increase in population which in turn places greater pressure on the resources of the environment and thereby creates the conditions under which greater energy or technology will be required. The cycle presumably continues until the energy and subsistence resources of the environment are exhausted. In effect this theory denies the adequacy of any technological or social organizational adaptation, since stability cannot be achieved. It is the thesis of this paper that man can reduce the challenge of his environment and, in the absense of cultural conflicts, can create a stable integration of cultural phenomena.

Technological Elements: Means of Subsistence

Technology is conceived as the means of subsistence and environment as its limiting basis. We turn first to the technological means that may reasonably be conceived to characterize stable forms of society. In the classificatinns suggested we have attempted to state logically distinct and ideal typical forms of technology bridging the gulf between the earliest stages of man's culture and the most recent but as yet incompletely realized stages of cultural evolution. In reviewing these stages it must be borne in mind that technology is here coneived as but one necessary dimension of the subsistence pattern within a culture complex, which cannot vary independently of its environmental basis.

Stage I: Hunting and Gathering. This is the most rudimentary stage of technological development where man generally relies on his own physical endowment and a small compliment of simple tools e.g. digging sticks and stones for cutting and beating. The generalized hunting and gathering of available flora and fauna may be characterized by either a seasonal variation in the available food supply or by a locally abundant food supply such as shellfish which may not vary seasonally. At this stage men lack adequate food-storage techniques and domesticated plants and animals (with the possible exception of pets) are also lacking. The size of the population and general sophistication of the culture depends on how abundantly endowed is the natural environment.

Stage II: Incipient Agriculture and Food Storage. The technology at this level includes either or both of the title features in the following patterns: (1) Incipient agriculture producing a small harvest to supplement the local endowment; (2) a storageable or preservable wild food harvest, such as acorns or mesquite beans; or (3) incipient agriculture producing a small harvest which supplements a locally available and storageable food supply. At this stage a somehwat larger population group can periodically sustain themselves in and around a particular region which may be considered a home base. The transformation of stones and digging sticks into cutting and planting tools would be characteristic.

Stage III: Extensive Exploitative Agriculture. The Technology can be characterized as simple or extensive exploitative depending on the fertility of the soil. The pattern of exploitation requires the successive transplatation of the social unit from location to location as the slash and burn methods of production exhaust the readily available soil fertility. "In the absence of restorative techniques to maintain productivity, or because of the perishable nature of the crops, no surplus can be relied upon indefinitely from the same fields or held against future needs" (Beardsley et al., 1956, p. 140). Until each area has been exhausted, however, the settlement can be maintained over a period of years. A number of specialized pursuits will be divided along sex and age lines.

Stage IV: Intensive Agriculture. There are two basic types of technological adaptation to essentially different environmental configurations (see Environmental Typologies C and D below). Agricultural techniques are characterized as generally restorative or conservational. Domesticated plants or animals, with the primary emphasis on agriculture, provide the basic source of the social organizational unit's subsistence. The per capita area required for maintenance subsistence and the production of a reasonably dependable surplus releases some segment of the community from the role of primary producers. Where the use of flood plains or irrigation techniques prevail, the restoration of the soil fertility is a natural process requiring less additional fertilization, and the application of relatively simple planting and harvesting techniques produces an abundant surplus. Where fallowing and fertilization are the prevalent restorative techniques, greater per capita area is required for maintenance subsistence and the production of surpluses. Fertilization in the latter technological complex is normally associated with stockbreeding. A surplus production of food is characteristically held against future needs.

Stage V: Incipient Commerce. This technological complex introduces something new to the bases of subsistence in that a dependence on trade relations with other outside sociocultural complexes is incurred to supplement the indigenously produced subsistence base. The surplus produced at this level is more than sufficient for local subsistence but social segmentation has made some centers of food production into centers of control for the purposes of administering, storing, and regulating production for the considerably enlarged population. Those social segments released from the position of primary producers become enlarged and stablizied and now expand the economy and variety to their staple through the extension of intra-social trade relatinns to inter-societal trade relations. Private accumulation or the enrichment of the "upper" controlling segment of the community is no longer restricted by the lack of coercive power in the hands of the community elite. A primary means of social differentiation arrives with the establishment of a new mode of exchange--the coinage of money--which is developed in the administrative or production control centers.

The accelerated development of metallurgy at this stage is expanded into local or state controlled industries involving extraction, and metal working e.g. coinage, iron plows, and swords. The contact with outside (non-kin, politically independent) socio-cultural complexes places emphasis on the need for defense of the entire area exploited as well as for the maintenance of privately held wealth in land resources and capital.

Stage VI: Extensive Commerce and Extraction. At this stage of technology, the interest of the community in defending its own territory, from invasion and/or exploitation originating outside the culture complex, is expended to the defense or acquisition of trade routes and outside sources of production. Commerce becomes extensive and such related trades as shipbuilding become major industries associated with trade, exploration, conolization and conquest. A superior means for waging warfare is characteristic at this stage and the accumulation of wealth in land, resources, and capital among the elite gives rise to the formation of private or state supported armies and navies. Depending on the proliferation of occupational specialization associated with production and required for subsistence, the concentration of control and extent of accumulation among the elite varies. Where great technological sophistication is required to produce the surplus necessary for trade and expansion, the spread of wealth in the community among all segments will be broader than where relatively little technological sophistication will support a society of the same size. Where in the latter case the relative technological sophistication required for a given population is slight, social differentiation will be sharper and the social structure will mature and rigidify more rapidly. Thus where irrigation techniques prevail, the size of the population will increase more rapidly, the socio-political structure will be more absolute, social and occupational differentiation will be sharper and the control of a religiously oriented elite more complete. Agricultural production, however, becomes stabilized in irrigation economies whereas production in fertilization economies continues to be improved. This fact makes the more homogeneous and absolute societies, associated with irrigation, more dependent on extra-territorial resources to maintain the ever increasing size of population.

Occupatinnal specialization at this level is associated with the intensive manufacturing of a few products for both trade and domestic consumption. Extraction industries at this point are extensive and highly exploitative of the readily available mineral resources. Typical manufactured products are pottery, cloth goods and metal objects either practical, religious, or ornamental. Finally, then, the entire social structure of the cultural complex is either marginally or primarily dependent on the commercial relations and/or territorail acquisitions established for improved subsistence and is thus characterized as "Early Imperialism." States located on major inter-national trade routes such as sea coasts are favored to become most highly developed first.

Stage VII: Extensive and Intensive Industrial. The industrial level of technology is characterized primarily by extensive manufacturing in areas most heavily endowed with the primary mineral resources: metals and fuels. Where these resources are found in conjunction, industrial development will be most rapid. The primary resources most characteristically associated with industrialization are iron and coal. Where these resources are separated across the national lines iron will be brought to the power source, coal, and capital accumulation will favor nations possessing power resources. Whereas exploration, colonization, and conquest characterized the previous means of improving the subsistence base, industrial technology emphasizes capital accumulation, purchasing power, and the achievement of a favorable balance of trade as the means of subsistence. States occupying the largest composite of environmental types with the greatest variety of agricultural and mineral resources are favored to dominate. The advantage adheres to such extensively based nations primarily because the movement of goods, men and capital can pass freely along trade routes, or without substantial impediment, to all sources of capital producing industry.

Social and occupational heterogeneity are favored over homogenetiy, since multi-segmented social stratification, highly differentiated occupational specialization, widespread and numerous centers of economic control, fragmented and diffused sources of political power and numerous and competing religious orientations cannot coalesce to impede the alteration of socio-economic relations. This does not mean, however, that cultural homogeneity and traditional social relations cannot be maintained in the face of industrial development but merely predicts that culturally heterogeneous societies will tend to develop initially.

It is appropriate to close our presentation of these seven stages of technological development with a brief discussion of their ranking for evolutionary purposes. Previously we suggested population size and density as consistent criteria for judging the extent of evolutionary progress. Taking off from the evolutionary concept of the survival of the fittest, which is interpreted merely as success in survival, Childe (1951) reasons that an increase in population is a fundamental criterion for judging human progress and the value of cultural changes to man in society. When other criteria such as political organization, social structure, and religion are considered we are in danger of using ethnocentric criteria for judging progress. The size of the population will serve as a reasonably reliable and scientifically consistent basis upon which to judge the level of cultural evolution. On grounds, then, of increasing ability to support large and dense populations, we shall assume that the seven stages of technological development given here, form an evolutionary sequence (as suggested by Beardsley et al and Wilson), although we shall have more to say on this subject at the conclusion of the next section of the paper.

While forewarned as to the danger of using ethnocentric criteria, recent conceptual developments in the study of economics, social organization, and ideology suggest the addition of other scientifically consistent criteria for judging cultural progress. It should be apparent today that the definition of a minimum subsistence varies not only between historical epochs but also from generation to generation. In addition, because of the increasing interdependence of modern societies, an attempt to measure the ability of any nation to support some population size would be a complicated problem. On the other hand variations in the definition of subsistence suggests the existence of a measurable gap between what might be ascertained as a bare minimum subsistence for the maintenance of human life and any historically prevalent per capita level of subsistence. In addition to assessing cultural progress in terms of a level of subsistence gap, a sort of parity subsistence level could be established for each stage of development to comparatively assess relative subsistence levels. It is not inconceivable that measures of socio-political complexity and efficiency or even of ideological sophistication might also be developed as scientifically consistent criteria.

Environmental Elements: Bases of Subsistence

We turn now to a discussion of the environmental bases of cultural evolution. Betty Meggers (1954) has set up four basic types of environmental categories which, unlike previous classifications, were constructed to differentiate between potentially significant cultural uniformities or similarities. As Meggers has aptly pointed out:

> "The primary point of interaction between a culture and its environment is in terms of subsistence, and the most vital aspect of environment from the point of view of culture is its suitability for food production....In some areas game, wild plants or fish were more important than in others, but the range of variation was slight in comparison with what it became following the adoption of agriculture....Most anthropologists, however, do not carry the analysis beyond the effect that agriculture has had on culture to the effect that environment has had on the productivity of agriculture. Differences in soil fertility, climate and other elements determine the productivity of agriculture, which, in turn, regulates population size and concentration and through this influence the sociopolitical and even the technological development of the culture" (p. 802).

The classification used for this paper is identical to the one Meggers developed with but two changes of some importance: (1) The classification developed here places emphasis not only on the agricultural potential of an environmental complex but also on its general geographic locale in relation to other cultural complexes, and its mineral resource potential as well. (2) The ranking of environments as having more or less agricultural or other potential has been altered with regard to the highest ranked environments. The names and descriptions of these different environments nevertheless remain basically unaltered and only their ranks have been changed.

Type A: Areas of No Agricultural Potential. "This includes the greatest variety of natural landscapes because only one of the many components necessary for agriculture need be absent for the area to be unsuitable. The defective element may be soil composition, temperature, rainfall, short growing season, elevation, terrain, etc. Type A regions include tundra, some deserts, tropical savannas, swamps, some mountain ranges, and similarly uncultivable types of land" (Meggers, 1954, p. 803).

Although some type A regions are suitable for advanced pastoral economies, this type of cultural complex has been excluded from this study of cultural and educational evolution (See Wilson, Chapter II). Generalized hunting and gathering is the level of technology associated with Type A regions.

Type B: Areas of Limited Agricultural Potential. "Here agriculture can be undertaken, but its productivity is minimized by limited soil fertility, which cannot economically be improved or conserved. When the natural vegetation cycle is broken by clearing, planting, and harvesting, the delicate balance between what is taken from and what is returned to the soil is upset. The soil is poor to begin with, and exposed fully to the detrimental effects of the climate, it is quickly exhausted of plant nutrients. The addition of fertilizer is not feasible on a primitive level or economically practical on a modern one. Since the major cause of this condition is abundant rainfall and high humidity, Type II environments may be restricted to the tropics, and a good example is the South American tropical forest and selva. This does not mean, however, that all tropical environments are necessarily Type [B] (p. 803).

This classification like all others suggested is, of course, based on present agricultural technology, and hence there is no assurance that tropical rain forest regions will always be classified as having a limited agricultural potential. Thus, it is apparent that agricultural potential depends not just on the inherent capacity of the soil or other elements but on the interaction of technology which has been discovered and can be mobilized to gain some economically feasible production.

Type C: Areas of Unlimited Agricultural Potential. "Here the natural environment approximates as closely as possible the ideal conditions for agriculture. Climate, water, and terrain are suitable and soil fertility is for the purposes of this discussion inexhaustible, so that the land can support intensive food production indefinitely. The 'cradles of civilization' all belong to Type [C]" (p. 804). Characteristically such areas include an extensive river valley which regularly floods the surrounding terrain and leaves a rich alluvial deposit, which automatically refertilizes the soil. Egyptian, Summerian, and Andean cultures are typical of Type C environments.

Type D: Areas of Increasable (Improvable) Agricultural Potential.

"Areas of this type contain all the essentials for agricultural production that exist in Type [B]. However, being in more temperate climates where rainfall and humidity are less detrimental, soil exhaustion is caused mainly by the raising of food crops. Under a slash and burn type of utilization, the productivity of the land is not much greater than that of Type B areas. However, crop returns can be appreciably increased by techniques such as rotation, fallow and fertilization, and the same fields can be kept in almost constant production over long periods of time if not permanently. Temperate forest zones like Europe and the eastern United States belong in this category" (pp. 803-804).

It was noted above that in Meggers' original classification, Types C and D were reversed; in the ranking presented here it is specifically implied that Type C regions, (those having unlimited agricultural potential) should be placed ahead of Type D regions (those having improvable agricultural potential) for evolutionary purposes. Since we are here in disagreement with Meggers, this argument should be spelled out.

As suggested in the previous section of the paper, our basic criteria for judging the evolutionary potential of environmental types must be their ability to maintain a sizeable and dense population. What, then, are the various potentialities of the four regions for population maintenance? We shall argue here that men are differentially motivated by the successful improvement of their subsistence level, that they react best to environments that present challenges which can be met and conquered. A similar point was made by Sauer (1936) when he said that men fared best in benign, varied, but not too opulent environs, which offered reward to industry and effort. Let us now apply this concept to the evolutionary ranking of the four environmental types.

Type A environments would seem to be ranked as having the least potential for subsistence as well as the least potential for rewarding man's efforts to change and improve his subsistence base, since they have no agricultural potential. Type B environments, which have a limited agricultural potential, would also fail to reward greater output of energy at the point where soil fertility fails to produce abundant crops on a consistent or even irregular basis. Any consistent attempt to farm Type B environments intensively will be met not just with failures to increase crop yield but with decreasing yeilds as a result of rapidly exhausted soil fertility.

Types C and D environments, on the other hand, have the potential for intensive cultivation. Their basic difference lies in the fact that wereas a Type C environment requires little energy output by man for intense agricultural exploitation, Type D environments cannot be so exploited without the development of at least a Stage IV technology requiring the use of fallowing and manure. Thus, the reward to man's energy in Type C environments will be immediate and consistent since the soil fertility does not get exhausted, and more intensive effort will achieve greater rewards in increased levels of subsistence. Type D environments, however, reward energy output less rapidly and less consistently, since it takes both greater effort and greater innovation to increase and preserve the yield of the soil. The periodic rewards to man's labor offered by successive agricultural and commercial stages in Type D environments reads like an attenuated or delayed reinforcement schedule, calculated by some malevolent experimenter to deny the possibility of extinguishing acquired motives for man's energy output. Thus, cultures established in Type C environments are less likely to produce men who are as motivated to work as men in Type D environments. In this light, the work ethic of the western world, or for that matter the Protestant ethic of European and American societies, can be viewed as the ideological outcome of man's material condition in Type D environs (cf. McClelland, 1961).

It would be easy, however, to overstate the case for this particular sequence of evolutionary potentials. It should be pointed out, for instance, that the four environments possess differential abilities to reward man's effort, depending upon whether that man is foraging, farming, or industrializing. Type D environments would have to be ranked most highly for foraging endeavors, while Type C environments offer greater initial potential for farming, in terms of rapid development and simple techniques. The fact that we have ranked Type D environments at the top of the evolutionary sequence reflects their greater initial potential for rapid industrial developments. In addition, it may be observed that whereas Type C environments cradled civilization, the most productive and industrialized cultures are found in temperate Type D environments. Although the population of industrial cultures is not the largest, they nonetheless support the most densely populated urban areas, have achieved the highest per capita subsistence level, and provide such an excess of food that over-production is actively discouraged. Hence, industrialized cultures have met the population test, in effect, because they possess the ability to support the largest population even though their level of subsistence gap disguises the full effect of improved technology.

Again, the easier and more rapid improvement of agricultural subsistence in Type C environments would tend to make them more attractive than Type B and D environments to cultures that had not bypassed the extensive exploitative stage of semi-sedentary agriculture (see Table 1, Stage III, Types B, C, and D). Tribes that had successfully enlarged both their population and territorial bases in Type D regions would then be attracted to the more productive Type C regions. The more aggressively competitive and mobile communities would be stimulated to conquest by their corporate interests as well as by population pressure for the obvious purpose of acquiring territory wherein the greatest gain could be achieved for the least output of energy or effort. This would account for the repeated attempts to conquer such Type C regions as the Nile and Tigris-Euphrates valleys and the conquests of the Andean culture area, the last of which (prior to the Spaniards) resulted in the establishment of the Inca empire (Means, 1932). Those cultures which follow this pattern appear to develop improved subsistence levels quite rapidly (Childe, 1951; Morley, 1956). It is likely then that any superior power to wage warfare in Type C regions was developed only after successive conquests and intensive pressure on the subsistence base had forced rapid and considerably superior utilization of technology in these areas. This reconstruction can also account for the fact that some technologically advanced peoples were displaced from Type C to Type B or A environments, where deculturation then took place (Meggers, 1954, pp. 808-809).

Culture Conflict: The Process of Evolution.

The differential ability of environments to reward man's labors at different stages and rates is a basic source of culture conflict. In the above reconstruction we have assumed that man's initial cultural adaptations took the path of least resistance for the greatest relative gain. Since Type D regions have the greatest abundance of flora and fauna and are most readily exploitable at the earliest stage of technology, they would be the most attractive regions. Evenutally then such regions would normally become the objects of inter-societal competition, as populations expanded, contacted one another, and attempted to defend or expand the territory available for their subsistence. In areas as hotly contested and in as short supply as Type D regions, the likelihood of warfare becoming an essential mode of cultural adoptation is substantially increased. With increasing population pressures and conflict, the need to find new regions to exploit or improve subsistence would simultaneously stimulate innovation and spread the range of settlement out of Type D and into Types C, B, and A in slow stages. Not until the spread of settlement was considerably advanced, however, would the need for improved subsistence stimulate agricultural innovation to support heavier concentrations of people in a smaller area. Such a reconstruction would explain the typically slow course of cultural development at the early stages of evolution.

Agricultural development, most likely to originate in forested regions of temperate climate and maleable soil, again gives the advantage to Type D environments (Sauer, 1936) over Type C, which are typically semi-arid regions capable of agricultural production only after plant domestication is achieved. Type B environments are also abundant in flora and fauna and perhaps more so than Type D environments, but living conditions are harder and the accessable subsistence supply is less readily exploitable on a consistent basis due to climatic extremes. Type A areas are, of course, eliminated from the competition after the introduction of agricultural technology and remain available to hunters and gatherers forced out of other regions. For Type D environments the decisively favorable factors at the early stages of technology (I and II) are the relative ease of exploitation and the diversified natural endowment, advantages which get differentially and periodically reinforced by the greater

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agricultural and mineral potentials revealed successively at later stages of evolutionary progress.

The thesis expounded here is that the motivation for improved technology is acquired as the result of population pressure and inter-societal conflict over the bases of subsistenence, which has the secondary effect of insuring the diffusion of improved technology within the environmental limits of any region. Thus, though man tends to concentrate his early cultural development in environments which provide the greatest abundance for the least effort, the initial pattern of environmental preference is altered by conflict, population pressure and the differential response or yield of environments to available technology. The conflict, however, does not alter the natural pattern whereby man seeks the most advantageous conditions.

It seems apparent that resistance to improved cultural adaptation, technological or other, can be inferred from other than environmental sources. Indeed someone might object to the foregoing general reconstruction on the grounds that we have assumed tribal warfare to be less costly, or a course of less resistance value, than technological innovation. The observation would be correct. Warfare would merely enhance the development of social relations already established as necessary to the intra-regional survival of a culture complex in competition over a territorial base with an expanded population. An alternation in the technology, however, would normally require an adjustment of social relations that radically alters the established or traditional pattern. Thus, any form of action which tends to conserve existing patterns of social relations will be preferred over innovative behavior which threatens to alter existing relations, unless (1) the survival of the group is threatened at its subsistence base, or unless (2) greater subsistence can be achieved for the group with less output of energy. We might in fact label these two conditions of anticonservatism as "hunger" and "seduction" respectively.

The only factor which provides a constant pressure for change and improved adaptation is population pressure which will always tend to expand to the limits allowed by the interaction of the means and bases of subsistence. Were the population cycle sufficient to explain cultural evolution, however, then there should be no evidence of cultural stabilization at levels below that of the maximum environmental potential. But we do find examples of societies that quite successfully cope with population pressure, at levels far below the maximum environmental potential, through such social organizational devices as marriage preference practices and various other social barriers to reproduction. A drive for progress attributed solely to the interaction of environment, technology, and population would further indicate that societies confronted by a limited environment would also be confronting immenent extinction. If it were not possible for man to stabilize his cultural mode of adaptation at a level below the maximum environmental potential then there would be little hope for stabilization at any higher level. On the contrary, there are indications that societies in relative isolation from external cultural contacts take the course of least resistance and culturally adapt at the earliest practicable interaction of technology, environment, and population pressure that can consistently provide subsistence (Sahlins, 1958). The logic of this "conservative" proposition suggests that technological innovation would most probably occur during or after periods of substantial conflict and crisis and would constitute a latent or unexpected outcome. Given some period of crisis, crop failures, famines, or wars would reduce the population and threaten, over time, the entire socio-economic fabric of the culture complex. Thus, after the depletion of the population and the threat to existing social relations materializes, there should be less resistance to change and innovation than when the population is near its maximum size for some subsistence pattern and conservatism is at its heighth.

Although we have shown that environments which have the greatest potential have in fact been increasingly well exploited, the interpretation developed suggests that technological sophistication has proceeded in spite of the tendency for the most favorable environments to be amenable to quite simple levels of technology. It is something of a paradox that the greatest cultural achievements have occured in the environments which initially required the least sophisticated technology.

Apparently there are some drives or motives beyond the basic hunger and sex drives that are acquired by man in the process of cultural evolution which lead him to expend greater energy than is required at the earliest stages of evolution. It is proposed here that inter-societal or cross-cultural conflict and competition for the high potential regions of subsistence provides a derived set of motives for man's further cultural adaptation, regardless of whether that potential is part of the natural endowment, agricultural, or industrial. There is support for this view in the fact that men in contemporary primitive cultures surviving in environments more harsh and demanding than Type IV, expend far less energy on a consistent day by day basis than men in technologically advanced cultures (Service, 1958; Holmberb, 1950).

Perhaps our argument may best be summarized as follows: At the earliest stages of cultural evolution man's behavior can be better understood with reference to his biological needs than at more advanced levels of socio-cultural evolution -- suggesting the early evolutionary potential of Type C environments. At the more advanced levels, where greater energy output is required, man's behavior requires more explicit symbolization and rationalization so as to better organize and direct his activities or energy towards the culturally derived and valued alternatives consistent with the pattern -- suggesting the later advantages of a Type D environment.

Dependent Variable Implications

We turn now to a review of the implications of the foregoing discussion for selected dependent variables. Following the lead of Beardsley et al and Wilson, we consider first the technological and environmental influences upon community settlement evolution. This is followed by discussions of ideology, sociopolitical structure, and finally education.

Community Settlement Pattern

The classification of communities utilized in this paper is drawn from the scheme of Beardsley et al plus one additional classification from Wilson for modern industrial societies. "The single most important criterion used in this classification is community mobility, and the names of the various classes reflect this interest" (Wilson, II-14). In addition, the authors attempted "to develop a classification of cultures that is usable with both ethnological and archeological data and that has functional and evolutionary as well as historical and descriptive significance" (Beardsley et al, 1956, p. 133).

A brief description of the classes is added here together with a discussion of the integration of the community settlement pattern with the stages of technology and types of environment. A summary of the presentation may be found in Table 1.

1. Restricted Wandering. "Communities that wander about within a territory that they define as theirs and defend against trespass, or on which they have exclusive rights to good resources

TABLE 1.

Community Settlement Patterns.

	Environments			
	A No Agriculture	B Limited Agriculture	C Unlimited Agriculture	D Improvable Agriculture
I. Hunting & Gathering	Restricted Wandering	Restricted Wandering	Restricted Wandering	Central-Based Wandering
II. Incipient Agriculture and/or Food Storage	Central-Based Wandering	Central-Based Wandering	Central-Based Wandering	Central-Based Wandering
III. Extensive Exploitative Agriculture		Semi-Sedentary		Semi-Sedentary
IV. Intensive Irrigation and/or Fertilization Agriculture			Simple Nuclear-Centered	Simple Nuclear-Centered
V. Incipient Commerce Extraction Manufacturing Capital			Advanced Nuclear-Centered	Advanced Nuclear-Centered
VI. Commerce Intensive Mfg. Conquest Exploration Colonization			Simple Supra-Nuclear Integrated	Simple Supra-Nuclear Integrated
VII. Industry Extensive Mfg. Fuel Powered Production Credit-Capital				Advanced Supra-Nuclear Integrated

of certain kinds. Movement within the territory may be erratic or may follow a seasonal round, depending on the kind of wild food utilized" (Beardsley, et al, p. 136). This pattern occurs with Stage I technology, hunting and gathering, in environments which have either a limited natural endowment of wild food or have limited access because of topographical or climatic extremes (Types A, B, and C).

2. Central Based Wandering. "A community that spends part of each year wandering and the rest of it at a settlement or 'central base,' to which it may or may not consistently return in the subsequent years"(Beardsley, et al, p. 138). This pattern occurs with Stage I technology where the natural endowment is both locally abundant and readily accessable (in Type D environments), and it also occurs with Stage II technology in all four environmental types depending on the existence of storage techniques and Incipient Agriculture.

3. Semi-Sedentary. "A community, which can be identified with a village, that establishes itself in successive locations, occupying each for a period of years. The population is stable and continuously sedentary, but able to be so only by moving the village periodically" (Beardsley, et al, p. 140). This pattern derives from Stage III technology, extensive exploitative agriculture, and is limited to Type B and D environments when it does occur. Community mobility is a direct result of the agricultural technology which superfically exhausts soil fertility, whether it is simple exploitative

over a narrow range or extensive exploitative over a wide range of territory. Hence, semi-sedentary communities are not found in Type C environments.

4. Simple Nuclear Centered. "A primitive center, with or without satellities. The center may be a self-supporting town, or a market or ceremonial place that serves as a focus for surrounding villages or hamlets. The center is not strikingly differentiated in content from its satellites except when its character is primarily ceremonial" (Beardsley, et al, p. 141). This pattern is the result of Stage IV technology, Intensive Irrigation or Fertilization Agriculture, which characteristically conserves soil fertility or restores fertility on a regular basis and occurs primarily in Types C and D environments.

5. Advance Nuclear Centered. "A community of homogeneous tradition differentiated into an administrative center and satellites consisting of villages, hamlets, and scattered homesteads" (Beardsley, et al, p. 143). This pattern is essentially an elaboration of the simple nuclear center with the addition of commercial administration by the upper classes which expands intra-societal trade to inter-societal commerce based on a standard medium of exchange, usually the coinage of precious metals. Incipient commerce for the first time supplements the indigenously produced subsistence base in Type C and D environments.

6. Simple Supra-Nuclear Integrated. "A community that integrates nuclear centers and other formerly independent units of heterogenous tradition, typically by conquest and subjugation" (Beardsley, et al, p. 145). This pattern results from Stage VI technology, Extensive Commercial, which by this point constitutes a significant portion of the community's subsistence. Colonization and exploration underscore the community's increasing reliance on additional subsistence from extra-societal sources. Thus, the community at this stage has become expansive either in the defense of trade routes, the acquisition of new territory, or both. This stage occurs in Type C and D environments where inter-societal competition and conflict is marked.

7. Advanced Supra-Nuclear Integrated. "A community that integrates nuclear centers and their satellites into a single, nationally homogeneous tradition, typically by political and economic inter-dependency" (Wilson, II, 19). This pattern results from Stage VII technology, Industrial, which comes to be based on indigenously extracted fuel or power resources for intensive manufacturing. Type D environments dominate the initial industrial developments.

Ideological Structure

The ideological structure of a culture is conceived in terms of its sacred-secular dimensions. Sacred knowledge focuses on magical or religious conceptions of causal relations whereas secular knowledge focuses on practical or scientific conceptions of causal relations. There is no judgment made here as to the greater value of one or the other since both may be equally untenable or illogical or both may be pragmatically sufficient to provide working explanations of real events. In addition we consider the extent of sacred-secular fusion or fission, or, in other words, the extent to which all knowledge is fused into one predominant and undifferentiated frame of reference or divided into separate frames of reference, one of which may predominate.

Cultures at the earliest levels of evolution characteristically tend to develop the most functional conception of sacred and secular relationships permitted by their material condition. Where the natural endowment of an environment is abundant and readily accessable for hunting and gathering cultures, non-functional beliefs are far more likely to occur. As technology provides a more reliable and secure means of subsistence this essential relationship is maintained with increasing elaboration of both sacred and secular beliefs and functions. Secular beliefs, when differentiated, tend to be most functional at all levels of cultural evolution since their central focus is on the most practical matters of subsistence, defense, and protection from the elements.

The expansion of sacred and secular knowledge varies primarily in relation to the stability and sophistication of technologico-environmental integration. The greater the stability and security of the productive relationship, where technology requires little increased sophistication to achieve an increased level of subsistence, the greater will be the elaboration and artistic sophistication of sacred knowledge. The more insecure the productive relationship, where technology requires periodic or increasing elaboration to achieve increased levels of subsistence, the greater will be the elaboration and practical sophistication of secular knowledge. As cultures evolve the initial fusion of sacred and secular knowledge disappears, but the character of the emergent fission between the two realms of discourse is determined by the nature of the productive relationship.

After the ideological frame of reference becomes detached from its more functional relationship with the primitive economy and social structure, the following ideological characteristics emerge in association with irrigation and fertilization economies.

1. Emergent cultural homogeneity characterizes the ideological structure of irrigation economies whereas emergent cultural heterogeneity characterizes the ideological structure of fertilization economies
2. Priests as a class are horizontally spread across the upper strata in the social structure of irrigation economies but are vertically spread and diffused throughout the social structure of fertilization economies.
3. Kings are divine in their person in irrigation

economies (where sociopolitical structure is highly centralized) but are merely sanctioned to rule in fertilization economies (where sociopolitical structure is decentralized).

4. Sacred terminology dominates the weltanschauung inherent to the ideological structure of irrigation economies whereas secular terminology dominates the weltanschauung inherent in the ideological structure of fertilization economies.

5. Cultural homogeneity gives rise to intra-cultural consensus whereas culture heterogeneity gives rise to intra-cultural dissonance, among discernable concrete social segments as well as within such segments.

These observations are summarized in Table 2 which presents an outline of the proposed evolution of ideological types that is similar to the community-type summary of Table 1.

Sociopolitical structure

The sociopolitical structure of a culture is conceived in terms of the most prominent positions of political power, the division of labor, and the class structure of the largest concrete unit which can characterize a level of cultural evolution for a particular technologico-environmental coordinate. The largest concrete unit is, of course, the society, which may vary in size from the nuclear family to the modern nation. The most prominent

TABLE 2.

Ideological Structures

Environments

	A No Agriculture	B Limited Agriculture	C Unlimited Agriculture	D Improvable Agriculture
I. Hunting &	Sacred-Secular Fusion magic-functional or permisi. assoc.	Magic functional association	Magic functional association	Sacred-Secular Fusion magic permissive association
II. Incipient Agriculture and/or Food Storage	Shaman	Shaman	Shaman	Shaman
III. Extensive Agriculture		Shaman		Shaman
IV. Intensive Agriculture			Sacred-Secular Identity Sacred terms Priest &/or Chiefton	Secular-Sacred Identity Secular terms Priest-separate class
V. Incipient Commercial			Sacred-Predominance homogeneity knowledge monopolized	Secular sacred conflict heterdgeneity knowledge diffuse
VI. Commercial			Sacred-Secular Conflicts externally derived	Secular-Sacred Conflict internally derived
VII. Industr trial				Secular-Predominance

Sacred-Secular Fisson

positions of political power may vary from the head of a family to kings or chief executives of modern times. The division of labor varies from the simple division along lines of age and sex to the complexity of full occupational specialization. Classes may or may not exist, and where they do, we attempt to focus on the most prominent class divisions.

The earliest levels of cultural evolution are characterized by little or no rank differentiation. Social equality is thus related to the fact that all persons regardless of sex are required to make a substantial contribution to the level of subsistence for the characteristically small social unit. The more abundant the natural endowment the greater the possibility of rank differentiation by both age and sex (Sahlins, 1958). Men typically rank higher than women because no biological functions interrupt their hunting activities. Where gathering predominates as a means of subsistence women will have greater equality and the division of labor will not be so marked along sex lines. Successful hunters generally achieve prestige and may become headmen but without coercive power. The size of the largest concrete unit is directly attributable to the abundance of the natural endowment for hunters and gathers as is the extent to which labor is divided by sex.

As agricultural technology appears, the size of the largest concrete unit is further expanded depending on both the abundance of the natural endowment and the stability and sophistication of the technologico-environmental integration. Where stable integration and more reliable subsistence is achieved, through food storage, a headman or the shaman will be transformed into a local chief or sacred leader with some power to coerce others and perhaps take a share of their products. Where integration is unstable and the level of subsistence is insecure, headmen will achieve little or no power to coerce others and rank differentiation will rarely occur. Extensive exploitative agriculture increases the level of subsistence but is intrinsically unstable and the subsistence insecure. Chief and shaman usually have power to coerce others depending on their relation to the acquisition of community subsistence. The shaman is the first powerful occupational specialist to emerge at early levels.

With the introduction of intensive agriculture, the first truly sedentary primitive state emerges. Social stratification is incipient to well developed as certain administrative, ceremonial, and technological pursuits receive the full time attention of some members of the community. Kinship based social organization is still prevalent but some families come to inherit an occupational speciality or position of power. Division of labor by occupation characterizes some portion of the population at this stage and supplements the marked division of labor by sex which emerges with early agricultural technology. Where productive relations are stable and secure, as in irrigation economies, differential status tends to vary between families consistent with the specialized position that is inherited. Where productive relations are unstable and insecure, differential status tends to vary within families, consistent with different specialties both achieved and inherited by members of the same family. Rigid craft specialization would be dysfunctional in a fertilization economy which periodically had to alter its pattern of technologico-environmental interaction and its corresponding social structure. For irrigation economies, particularistic selection of occupational specialists and members of the elite is both probable and initially a most functional means of social control. In the latter case change consists in expansions and elaborations in the fundamental technology and the corresponding social relations firmly established by tradition.

The class structures of irrigation and fertilization economies also emerge with distinctive characteristics. The greater the stability and reliability of the productive relationship in irrigation economies, where technology requires little increased sophistication to achieve increased levels of subsistence, the greater will be the tendency to vertical differentiation between occupations and classes. Positions with rank will more consistently tend to hold greater power and privilege in the social structure. Prior to the full development of commerce (Stage VI), but subsequent to the full development of the agricultural potential (Stage IV) of irrigation economies, the elite upper class would include all priests, wealthy aristocrats, military specialists and other administrative and ceremonial functionaries. The lower classes would include all primary producers such as craftsmen, independent merchants, and agriculturalists. The freeing of labor from primary production, however, also results in the creation of an even lower category of "construction workers," employed in the construction of ceremonial monuments and other public works, whose ranks are joined with and become identical to those of slaves captured in warfare.

The greater the instability and periodic insecurity of the productive relationship in fertilization economies, where technology requires periodic innovation and alteration to achieve increased levels of subsistence, the greater will be the tendency to horizontal differentiation between occupations and vertical differentiation within occupational groups. Positional designations which represent broad occupational categories do not consistently hold a single rank or an established position of power in the social structure. The growth and expansion of the state through the various stages of agricultural and commercial development depends on the flexibility of the process of social occupational selection. Thus, members of the military establishment, the priesthood, and merchant positions are distributed more fully throughout all classes so as to facilitate social adjustments and adaptations to periodically recurring shifts in the technologico-environmental pattern of integration. To illustrate the vertical differentiation of segmented occupational positions we can consider soldiers and priests, whose ranks would include both upper and lower class functionaries with entirely different functions only some of which were powerful. Both the professional priesthood and military would draw their ranks from all classes. Since fewer persons can be spared from full-time non-producing occupations, the monopolization of knowledge by the ruling elite and the establishment of a large full-time professional army is too costly. The possession of both sacred and secular knowledge by primary producers is therefore to some extent a requirement of fertilization agriculture, which will not permit the establishment of a centrally controlled, uniform, and consistent productive relationship. The lack of a stable productive relationship thus also inhibits the permanent establishment of centralized control of agriculture from a distance or by "absentee" administrators. Socio-political power is thus typically segmented; i.e., diffused among local and central authorities and between members of the same occupations.

This contrast between irrigation and fertilization economies merely emphasizes the ideal typical characteristics of their respective societies but does not deny the periodic existence of opposing or non-typical tendencies in both types of societies. Thus, where the period between major culture crises is extended in fertilization economies a tendency will be found towards rigid class structure, vertical occupational differentiation, or even centralized absentee administration. Likewise in irrigation economies, where cross-cultural competition, inter-societal trade and warfare occur with some regularity, a tendency will appear towards less rigid class structure and the periodic breakdown of vertical occupational differentiation by rank. It should be noted, however, that the sources of opposing or non-typical tendencies in the sociopolitical structures derives from atypical conditions in both types of economy. The stability of absolutistic sociopolitical structures in irrigation economies tends to be threatened most by external or cross-cultural conflicts effecting the productive relationship, whereas the stability of segmented sociopolitical structures in fertilization economies tends to be threatened most by the internal stability or stagnation of the productive relationship.

The extent to which absolutistic sociopolitical structures with irrigation economies become dependent on commerce or any other extra-societal sources of subsistence bears directly on their social organizational and ideological stability. The greater their commercial dependence, the greater the threat of their cultural extinction and improverishment. Whereas extensive commerce increases the subsistence base of the society and permits an increase in populations, it also introduces dependence on a relatively unreliable means of subsistence, a novel pattern to which society has not previously adapted. The conquest of foreign producers with different means of subsistence further threatens the society since its characteristically rigid administration and particularistic regulation is not as functional. The necessity to keep trade routes open and occupy foreign soil increases the requisite size of the army which must be drawn from the lower classes and involves the integration of foreign elements or their acculturation, thus threatening traditional social relations, not to mention the introduction of foreign beliefs which will compete with the sacred ideology. Rigid social stratification, which is characteristically bifurcated between the ruling elite with its attendant hierarchy of functionaries and the vast laboring and producing masses, is dependent on an unsophisticated agricultural technology that is inapplicable in most other environments. The elite are rendered useless by their lack of administrative flexibility and secular knowledge.

Thus, we can conclude that irrigation economies would develop and sustain most stable advanced sociopolitical and ideological structures where they are most insulated from extensive cross cultural conflict and commerce. For irrigation economies to increase their means of subsistence beyond Stage V technology is to invite cultural disaster, since they generally lack both the environmental basis for sustained growth and the knowledge, motivation, or social organizational flexibility for further adaptation and innovation. Commercial imperialistic nations with irrigation economies represent an epiphenomenal over-extension of theindigenous potential of Type C environments, resulting from unavoidable cross-cultural conflict and competition. These environments are most amenable to agricultural development but resist diffusion of early industrial technology adjunct to commercialism.

The extent to which segmented sociopolitical structures in fertilization economies become dependent on commerce, or any other extra-societal sources of subsistence, bears directly on their social organizational and ideological growth. The greater their commercial dependence, the greater the stimulus to their cultural expansion and enrichment. Extensive commerce is most likely to supplement the subsistence base where it was traditionally insecure and thereby free labor to develop the abundent mineral resources for extraction and manufacturing industries. The unreliability of commercial food sources is no greater threat since it is supplementary to an unstable subsistence, a pattern to which the society has previously adapted. Threats to the level of subsistence are more likely to occur, but they also are more likely to stimulate the greater innovation and effort characteristic of people in a Type D environment.

Conquest, exploration, and colonization not only stimulate industrial development but draw upon and develop the administrative, technological, and organizational sophistication that is traditionally requisite for improving agriculture in Type D environments. The flexibility of social organization and diffusion of power among local centers and between occupations facilitates the development of wealthy merchant *traders who form the basis for powerful middle classes.* Highly skilled artisans become independent of agricultural production and together with the merchants form an urban middle class power bloc to compete with the landed aristocracy and the priesthood for power under the king. With this support of the wealthy middle classes the king can transform his position into that of a sovereign ruler and not just the first among nobles. Government becomes bureaucratized and centralized but governs most effectively through regional departments under local officials who have great power of decision. The drive for capital accumulation and national self-sufficiency leads eventually to international inter-dependence. Because of the impossibility of doing business on a large scale with bullion or other coinage, credit or some standardized paper or book medium of exchange is developed to facilitate trade relations and the continued flow of goods upon which nations seeking self-sufficiency become dependent. The development of credit through trade balances and clearing houses is a great accelerator of industrial development, facilitating investment in industry far beyond the centers of capital accumulation which provided the original capital surplus for the development of urban crafts.

The tendency of industrialization to stabilize productive relations in Type D environments promises to reverse a long standing pattern of sociopolitical adaptation. With the advent of industrialism based first on capital accumulation and second on indigenously abundant coal and iron resources, the greatest increase of population in human history occurs based on industrialism as the highest known stage of cultural evolution. The development of functionally autonomous and local corporate control of production in the early stages of industrialism is an extension of the pattern of diffusion of economic and political power sources typical of segmented fertilization economies in Type D environments. But the growth of the corporate state, as well as the giant corporation, signals a substantial reduction in intra-societal conflict and promises to accelerate the tendency to centralize sociopolitical structures typical of irrigation economies in Type C environments. As the predominant secular ideology becomes formalized through the development of science, the characteristic heterogeneity and functional autonomy of society and its ideological orientations may disappear, accelerating the tendency towards cultural homogeneity and absolutism on a world-wide basis.

Assuming the continued spread of industrialization via more economical and more universally applicable technology, cross cultural conflict could presumably be reduced thereby increasing the level of cultural integration among all societies and culture areas. The differential rate of industrial growth, however, insures the continuance of conflict as well as regulated competition. The more highly industrialized the society the greater the tendency to prefer stability in its international relations. The outbreak of war would indicate a failure of diplomacy whereas it would be an instrument of policy at early stages of development. In general the continuation of cultural conflict between societies at different stages of economic growth will accelerate the growth of the subordinate entities and reduce the differences between the oponents. The broader the range of conflict (the greater the number of spheres of conflict) the less likely that conflict will be violent or warlike.

Once again, these observations for sociopolitical structure are conveniently summarized in tabular form. Table 3 presents a brief version of these observations.

Educational Forms

In summarizing the impact of societal evolution on education we have again drawn from Wilson (Chapter II). A total of three

TABLE 3.

Sociopolitical Structures

Technological Stages	Environments A No Agriculture	B Limited Agriculture	C Unlimited Agriculture	D Improvable Agriculture
I. Hunting & Gathering	Nuclear-Extended family Div. of Labor by age or age & sex	Nuclear-Extended family Div. of Labor: age & somewhat by sex	Nuclear-Extended family Div. of Labor: age primarily	Lineage-Extended family band Div. of labor by age and sex
II. Incipient Agriculture and/or Food Storage	Extended family band Div. of lab. by age & sex	Extended family Band - Div. of Labor by age & Sex	Band - Tribe Div. of Labor by age, sex & occupation	Band - Tribe Div. of Lab: Age & sex - some occup. spec.
III. Extensive Exploitative Agriculture		Tribe - Div. of labor & occupation		Tribe-clans-moieties Div. of lab: age, sex & occupation
IV. Intensive Irrigation & fertilization Agriculture Plow			Primitive state - Div. of labor by occupation	Primitive state - Div. of labor by occupation
V. Incipient Commerce - Extensive Extraction Metalurgy			Nation State Full horiz. Full occupa. specialization	Feudal State Full verti. full occupa. specialization
VI. Commerce Conquest Exploration colonization Capital - Intensive mfg.			Imperial State Full Specialization	Imperial State Full Specialization
VII. Industry Ext.-Int. Mfg. Ext.-Int. Agri. & Extraction Fuel power Capital-Credit				Modern Nation Diffuse Stratification Bureacracy

characteristics were deemed fundamental to any type of education: who is educated, who educates, and what is the purpose of education. Education is then defined as "everything that happens to an individual involving social interaction where at least one actor has as his purpose the instruction of at least one other actor" (II-55).

The two-fold classification of each characteristic is breifly provided here. Each characteristic is presumed to vary independently of the others. Only the classification of educational purpose has been altered from the Wilson version.

"Who Is Taught? The two-fold classification of this characteristic is as follows: All individuals are taught or some individuals are taught. It must be understood, however, that 'all individuals' refers to individuals in a given age and sex category, and some individuals refers to less than all individuals in a given age and sex category" (II-64).

"Who Teaches? Someone who occupies the position of 'teacher' in a given setting or someone who does not occupy a position of 'teacher' in a particular setting. These two classifications will be abbreviated simply as teacher and non-teacher." It is assumed that a position of teacher either will or will not be designated on a spare time, part time, or full time basis. In addition, it is assumed that where the position of "teacher" occurs the position of "student" also occurs. "Whether or not a teacher position is specified may depend exclusively upon the setting. For example, ...a plumber teaching his helper to be a plumber does not occupy a teacher position; the same man teaching plumbing in a trade school occupies a teacher position" (II-64).

The Purpose of Education. The two-fold classification of this characteristic is as follows: specific education or non-specific education. By specific education we mean that the student is taught a particular body of knowledge or a particular skill to equip him to occupy a particular position within the society or to interact in an identifiable social segment of that society. An identifiable social segment is an ethnic, religious, racial, social class, or other grouping within the larger society. By non-specific education we mean that the student is taught a general body of information or generalized skills which he will need to participate in the society-at-large. Teaching a few of the individuals in the culture to be plumbers or engineers is a type of special education; giving religious or military training, for example, to all students of a particular age and sex category is also a special type of education. The teaching of social manners, the folkways and mores of the culture, language, reading and writing, etc., is generalized education when it equips the individual for a generalized position or for interaction in the society-at-large. If the individual is taught the language and customs of only a segment of the society then it is by definition not generalized but special education preparing the individual for interaction within an identifiable social segment (See Wilson, II-64, 65).

Each of the characteristics is presumed to vary independently of the others, and together they provide a typology of eight nominal types. The eight nominal types are as follows:

1. Non-teacher--all individuals--non-special
2. Non-teacher--some individuals--special
3. Non-teacher--all individuals--special
4. Non-teacher--some individuals--non-special
5. Teacher--some individuals--non-special
6. Teacher-- some individuals --special
7. Teacher--all individuals--special
8. Teacher--all individuals--non-special

We turn now to the problem of relating these eight forms of education with the technological and environmental variables that determine societal evolution. The specific predictions for the emergence of educational forms follows those made by Wilson on the basis of the community settlement pattern. Our predictions are differentiated, however, across the four types of environments where similar technologies are found to be present. Also presumed is that societies accumulate types of education as higher levels of culture are achieved. Only the relative emphasis or cultural reliance on a type of education is likely to be altered from stage to stage within a particular environment, for as societies evolve and change so, too, do the educational requisites for its maintenance. As before, our observations are again summarized in tabular form (Table 4).

TABLE 4

Forms

Environments

Technological Stages	A	B	C	D
I. Hunting & Gathering	Type (1)	Type (1)	Type (1)	Type (1) Type (2)
II. Incipient Agriculture and/or Food Storage	Type (1) If food storage then Type (2)	Type (1) If food storage then Type (2)	Type (2) Type (3)	Increase Type (2)
III. Extensive & Simple Exploitative Agriculture		Type (2) If extensive then Type (3)		Type (3)
IV. Intensive Exploitative Agriculture			Type (4)	Type (4)
V. Incipient Commerce			Type (5) Type (6)	Type (6)
VI. Commercial Early Imperialism			Increase Type (6)	Type (5) Type (7)
VII. Industrial Late Imperialism				Increase Type (7) Type (8)

Education in Type A Environments. Hunting and gathering is the only technology that can produce any subsistence pattern at all. At the earliest level of restricted wandering the predominant concrete social structures are the nuclear or extended family. Division of labor is at best by age and sex. The concrete unit is small and requires the sharing of knowledge by all adults who must contribute to the subsistence of the group and permits no specialization of labor. The type of education present is thus exclusively Type (1), non-teacher--all individuals--non-special. With the addition of food storage techniques the size of the largest concrete unit can be expanded permitting some specialization. The position of shaman generally is the first such specialist to emerge though others may arise in time. Thus, another type of education should emerge: Type (2), non-teacher--some individuals--special.

Education in Type B Environments. Agricultural technology, which is limited to an early stage of development, will increase the size of the largest concrete unit, making further specialization of labor possible and also the inception of clans or moieties. This would only occur, however, where the range of territory would permit extensive agricultural exploitation of the soil which would be typically exhausted quite rapidly. Thus, at stage III, Type (3) education, non-teacher--all individuals--special, would emerge to initiate all within a certain age or sex group into the lore or skills which are the birthrite of members of their social unit.

Education in Type C Environments. Agricultural technology at the incipient level produces a more abundant product than in any other environment, thus, both Types (2) and (3) education should emerge during the same stage (II) of technology. The level of subsistence should permit a rapid increase in the size of the population and of the corresponding largest concrete social unit. Tribal organization with clans or moieties as well as some specialization of hunters would occur, since a diet of cereals only would probably constitute meagre fare. The transition from central based wandering with incipient agriculture to simple nuclear centered settlements with intensive agriculture should be comparatively rapid and should bypass the stage of extensive exploitative agriculture. Where annual floods automatically fertilize a deep alluvial soil along the river banks, the necessity to remove the settlement to more fertile ground is eliminated.

With the development of drainage techniques and irrigation ditches (Stage IV) the possibilities for increasing the level of subsistence are as limited as the extent of such terrain itself. The number of people freed from primary food production makes full time specialization "characteristic of some part of the population, either in administration, ceremonialism, or technology" (Beardsley et al , 1956, p. 142). Specialists typically inherit their positions, and differential status tends to seperate the families into different occupational categories. Whereas the specialization of crafts can be maintained through Type (3) education of an apprentice-master form, the formation of social classes based on status differences between the upper class priests and chieftians and the lower class producers would give rise to a type of education in social behavior which would further differentiate the classes: Type (4) non-teacher--some individuals--non-special.

The surplus production of agriculture of stage V technology is typically in the hands of the elite who can use it to further enhance their wealth and prestige through the development of trade with other societies. Full occupational specialization and the growth of advanced nuclear centered communities are consistent with the increased size of the entire population and the enlargement of the elite. The elaboration and standardization of sacred knowledge, and the development of extensively coercive power in the hands of the elite, permits the first introduction of formal education. Thus, the elite continue to receive non-special or general education in social skills and manners appropriate to the positions they will inherit but for the first time a teacher specialist does the educating so that Type (5), teacher--some individuals--non-special, education emerges. The temples typically become the school houses of the elite, and some preist is given the position of teacher.

Professional armies are also characteristic at stage V technology and are employed to defend the territory from envious invaders as well as to police the state, by enforcing the absolute law of the king and protecting the wealth of the aristocracy. The standardization of sacred knowledge leads also to the expansion of the preistly profession which requires mathematicians, scribes, and astronomers so vital to the ceremonial regulation of production, construction of temples, and other specialized functions. Hence the introduction of Type (6) education, teacher--some individuals--special. The monopolization of sacred knowledge in hands of the elite, however, does not permit the further expansion of formal education in either special or general areas to all individuals.

Education in Type D Environments. Because of the comparative abundance of the natural endowment Type (2) education for the position of shaman should occur at the earliest stage of technology along with the establishment of central based wandering. The introduction of early agriculture technology does increase the level of subsistence, but because cultivation superficially exhausts the fertility of the soil the population increases more sporadically. Food storage and eventually extensive exploitative agriculture (stage II) would allow the development of some craft specialists and thereby increase Type (2) education. The development of tribal social organization with clans and moieties (Stage III) would permit Type (3) education as well.

The domestication of animals and plants provide the elements necessary for the eventual establishment of a truly sedentary agricultural pattern of subsistence. The introduction of fallowing and manure fertilization at stage IV technology has the effect of conserving and restoring the fertility of the soil. Before the system achieves a level of technological sophistication which permits indefinite productivity from the land, however, several additional improvements are required. The rotation of crops, the introduction of restorative grasses, deep plowing, and chemical additives are just a few of the many successive improvements required to sustain the fertility and productivity of the soil. The greater emphasis thus placed on technological sophistication requires that special education for both all and some be continually expanded. Thus, though social classes emerge with powerful elites who receive Type (4) education, non-teacher--some individuals--non-special, the primary emphasis will be placed on special education for all. Tribal federations and alliances, that give rise to the primitive state, thus retain some special characteristics of their tribal traditions and give society a socially segmented and heterogenious character.

With the introduction of commerce and the growth of cities on a large scale at Stage V, occupational specialization takes place at the local levels and within families. Hence the next logical type of education should be Type (6), teacher--some individuals--special. Only with the expansion of commerce from competitive trade, to conquest, exploration, and colonization (at Stage VI) will power and wealth of the elite be sufficiently concentrated for the introduction of Type (5) education, teacher--some individuals--non-special. In addition, the emphasis on secular knowledge and technological sophistication characteristic of fertilization economies is substantially accelerated by the introduction of extensive commercialism and industrialism. The acquisition and defense of an empire requires that all, regardless of their occupational specialization, be conscripted for military service in defense of the empire or its trade routes which involves Type (7) education, teacher--all individuals--special.

Finally, the industrial stage of technology (Stage VII) requires diversified specialization of greater variety than any preceding stage, but the growing standardization of secular knowledge permits the formalization of fundamental education in mathematics, reading, and writing which are commonly required for the performance of any occupational speciality. Thus, for the first time Type (8) education, teacher--all individuals--non-special, emerges. In keeping with the established tradition, the diffusion of power and knowledge among the heterogeneous segments of society divides political power between central and local centers and within occupational specialties, which further provides for social selection of specialists on a more universalistic basis, at least in the present early stage of industrialism.

It is useful to point out one of the several cases in which our discussion of the evolution of education differs from that found in Wilson. The importance of considering ideology and the sociopolitical structure in a culture when attempting to predict educational form can be illustrated by contrasting typical socio-cultural complexes at Stage V technology in Types C and D environments.

Irrigation economies in Type C environments are characterized by sociopolitical stability, rigid social stratification, and the monopolization of wealth and knowledge by the ruling elite (see Wittfogel, 1957). All knowledge tends to be cast in a traditional and sacred frame of reference in which cast it is elaborated by the elite. Formal education in such societies thus concentrates on the transmission of the established and elaborated traditions to the ruling elite who have a vested interest. Those who do receive formal education receive both general and special education from specialized teachers who share the vested interest of the class they serve and have a private interest in the continued dominance of the sacred frame of reference which they sell.

Fertilization economies in Type D environments, contrastingly, are characterized by sociopolitical conflict, flexible social stratification, and a diffusion of wealth and knowledge among vertically stratafied and horizontally distinct social segments. All knowledge tends to be cast in secular or practical terms which reflects the greater emphasis placed on production resulting from insecure subsistence. Since fewer individuals can be spared from highly specialized production for specialization in teaching, informal education through apprenticeship becomes expanded, and only the special education of priests and professional soldiers can be sufficiently formalized for the introduction of teachers. The diffusion of power and rank inhibits the introduction of general education for some since no style of interaction would be common to all the ruling elite.

Cultural Transmission and Educational Feedback

We have argued that the evolution of educational types cannot be understood without also appreciating the community, ideological, and sociopolitical forms that appear within a given technologico-environmental complex. Is it also possible that education affects society directly, that education itself is a source of social change or stability? We shall argue here that the answer to this question should be yes; indeed it is difficult to understand either stability or societal change without considering education as a feedback mechanism.

Education and Cultural Transmission

Since human culture is dependent on man's ability to symbolize and rationalize his phenomenal experience, it is obvious that intellectual achievements are at some point more important than technology and environment to man's cultural evolution. No environmental potential would have been realized if man had not conceived of some technological innovation. We can theoretically specify that point of departure. The attempt to reduce existing cultural conflicts by seeking to achieve superiority or equality with a competing cultural entity by the creation of an additional order of technology, constitutes an evolutionary cultural departure. In large measure the capacity of a society to improve its level of subsistence and thus culturally progress depends on the type of education that emerges to transmit the culture from generation to generation.

It has been frequently noted that most of the great urban civilizations known to man developed their fundamental technological innovations for agriculture and industry at an early stage of cultural evolution, and that these fundamental discoveries were either diffused spacially or independently discovered (Childe, 1951; Jacquetta Hawkes and Woolley, 1963). Whether basic technological innovations, such as calendars, writing, agriculture, weaving, metalurgy, and mathematics, were independently discovered or not is of little moment since no socio-cultural complex could utilize the advances unless problems stemming from the subsistence pattern made their usefulness apparent.

Whether by innovation or diffusion, technological or related improvements in social organization cannot be utilized by a culture unless the environment, in which the society is based, will permit an improvement in subsistence. When population pressure and conflict threaten the subsistence base of a culture, diffusion and innovation are far more likely to occur. In environments which do not permit technological improvement, however, diffusion and innovation will not occur, and the society will be stabilized. Changes in social organization and ideology may continue beyond the stabilization of technology, but their complexity is limited by the size of the population and men are most likely to merely elaborate elements of the culture which are already present. This latter is often the result of centuries of conditioning.

The preservation and stability of a technologico-environmental complex and its unique sociopolitical and ideological structures requires a system of maintenance. Whereas socialization and apprenticeship will serve the needs of less complex structures at early levels of cultural evolution, more formal types of education are required at advanced levels. This formal education, involving persons designated as teachers and students in some classroom settings, does not supplant socialization or apprenticeship methods of educating; it merely displaces such methods in certain areas where standardization of knowledge has been achieved sufficiently well to permit the training of larger numbers in either special or general areas of general cultural significance. Thus, education at any level of culture is conceived, at least in part, as a necessary means of cultural transmission.

The point has already been made that man survives and adapts by means of his acquired and accumulated cultural trappings, of which the most significant tool is his capacity to symbolically represent and physically manipulate the elements of his environment. Education then plays the key role of transmitting this accumulated capacity.

Education and Cultural Innovation

It is now appropropriate to raise the question as to whether or not education could have contributed to the demise or success of a cultural pattern. A superficial review of the theoretical orientation tells us that nothing could save the absolutistic sociopolitical structure and sacred ideology of nations with an irrigation economy that have become substantially dependent on a relatively unreliable outside source of subsistence, through commerce, conquest, or colonization. Yet we observe that absolutistic sociopolitical structures continued to survive in Egypt, long after the demise of the Egyptian empire. Thus, we might ask, can some absolutistic sociopolitical structure generically related to an indigenously evolved structure continue to evolve and progress in a Type C environment? To answer the question in any detail would require more time and space than we presently have, but some answer to it is implicit in the theoretical orientation.

Resistance to progressive adaptation is due not just to the environmental potential, as pointed out previously, but also to cultural stabilization where nations or tribes are relatively free from cross-cultural competition and conflict. The evidence indicates some support for that idea. China and India, both of which developed in relatively isolated Type C environments, maintained a stabilized absolutistic sociopolitical structure and sacred ideological structure for centuries prior to their colonization or exploitation by conquering European nations.[2] On the other hand, Egyptian and Sumerian cultures failed in competition with other near eastern nations such as the Hittites, Persians, and Macedonians, all of which were comparatively short-lived empires in their own right and which had attempted to model their sociopolitical structures after those of Sumer and Egypt. It is apparent then that absolutistic sociopolitical structures can survive in Type C environments, but it is not yet apparent that they can further evolve. It is a matter of fact that none of the nations now occupying those "cradles of civilization" with Type C environments have as yet emerged as major industrial nations.

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[2] China did fall victim to nomadic herders from the north but the Chinese government and culture remained unmolested by the invaders who raided, plundered, and then exacted tribute. India also had been conquered but succeeded in absorbing the conquerors. India and China were on the fringe of the world's trade routes and whether by diffusion or not, developed more slowly than in the competitive near east.

It is also a fact, however, that modern nations occupying Type C environments often include other types of environments as well. India and China for instance, have a sufficiently extensive land mass to be called composite environments. In other words, they include sufficient resources to develop as industrial nations without depending on trade or commerce to supply basic raw materials such as iron and coal. India's ore is of a low grade, but as the world's supply of high grade ores are exhausted they should be in an advantageous position. Japan has industrialized without possessing her own ore. In addition the technology of fuels that has developed in the west will undoubtedly soon replace coal as the primary power source of industrialization. The point is that nations which develop first in Type C environments, because of the unlimited agricultural potential and minimum technological requirements, may continue to evolve by altering their environmental complex to include regions with additional potential. For powerful nations such as Egypt and Sumer, at advanced levels of evolution, the shift of their land base would not have been an impossible feat, since at one time or another they had conquered lands distant from their own. India and China might have simply utilized some other portion of their typically composite environmental range.

Resistance to change must then, by default, be attributed to the accumulated cultural tradition, to the sociopolitical and ideological structure of cultural complexes which evolve and develop in Type C environments.

The ideologically homogenious and politically absolutistic cultures which characteristically arose in irrigation economies were based on intra-societal consensus as to the sacred value and rightness of all cultural features. Monopolization of knowldege, religious and practical, became an additional property of the elite. The classes which were least directly involved with the production of goods emphasized the more esoteric aspects of knowledge and avoided the formal education of the lower classes. This fact alone is sufficient to inhibit further technological and socio-cultural innovation since the elite have a vested interest in the maintenance of traditional social relations and the lower classes cannot share in the ongoing development of the culture. The feedback machanism of cultural change is thus stymied since the lower classes share none of the special knowledge concerning the management and organization of the economy.

On the other hand such societies may expand their inter-societal contacts through trade relations and consequently expose their ideological consensus to the introduction of new and different ideologies. These new ideological elements pose a very real threat to the culturally homogenious and absolutistic society by their very presence. Since considerable diffusion can take place between societies in Type C and D environments, foreign ideas about social relations, religion, and the division of labor can infiltrate all classes and hence destroy the emergent homogeneity of the culture. Thus, both the cutting off of education which narrows the chances of progressive technological and cultural innovation, and the infussion of ideologically foreign and dissonant cultural elements, which threatens the homogenious character of the culture complex, combine to sow the seeds of revolution against cultural stagnation and prepare the way for conquest or absorption by other more vital nations.

The analysis can be summarized theoretically to state that dissonance drives out consensus and that cultural hetergeneity prevails over cultural homogeneity. Culturally heterogeneous societies are less likely to be threatened by foreign contacts with new cultural elements since the complex already includes diverse elements. Whereas an advanced society in Type C environments may weaken itself so as to fall victim to less well developed societies which are more warlike, this is not equally true of societies in Type D environments which are stimulated by contacts and cultural diffusion of ideas and technology--most of which is needed or can be utilized to good advantage.

Our conclusion is that cultural progress through innovation requires that competing or distinctive segments of society should possess sufficient power and sufficient knowledge to effectively control or check the acquisition of absolute power in the hands of a ruling elite or to provide for the circulation of elites. The interdependence of distinctive social segments should thus be reciprocal not just economically but politically and ideologically as well. Egypt died of cultural stagnation, not just because of her environment but because the ruling elite, which initially did not have to share its power or its sacred knowledge, would not share it when it was necessary. Formal education for all segments in society thus plays a key role in any advanced culture. Whereas in Type C environments it can be denied, it is requisite in Type D environments.

Epilogue

This paper has been concerned with a conflict theory of cultural evolution and a classification scheme which emphasized technology and environment as determinants of a complex set of cultural characteristics. It was proposed that cultural evolution depends on sustained cultural conflicts to progressively motivate man's achievement of innovations which alter the interaction of technology and environment. The impact of these two factors at successive levels of culture was explored in terms of community settlement patterns, ideologies, sociopolitical structures, and various types of education. It was pointed out (a) that educational types cannot be understood outside of their ideological and sociopolitical contexts, and (b) that education in and of itself acts as a crucial feedback device, with the potential for either denying or speeding the process of cultural evolution.

The central hypothesis of this paper is but another version of the widely shared but controversial proposition that human society is technologically or economically determined. Among students of human behavior there has always been a controversy over which of two frames of reference will best serve to understand and predict the course of man's history. The controversy is between: (1) those who would explain man's behavior primarily in terms of power relations or the political structure of society, and (2) those who would explain man's behavior primarily in terms of his needs for subsistence or the economic structure of society.

In our experience the further one gets from man's cultural phenomena the more salient its economic dimensions appear, whereas the closer one gets the more salient are its political dimensions. This difference in the appearance of reality can account for the traditional bifurcation in viewpoints between the evolutionary and historical perspectives on human culture. Since human nature has both of these aspects and more, surely the scientific study of man can divide its attention by deciding which orientation is more appropriate for what sort of problem. In a very real sense, evolution chooses the more appropriate economic orientation, because it must support the most general and hence most distant orientation to man's behavior.

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Chapter IV

Autonomy Structures in the School

Fred E. Katz

Introduction

The purpose of this paper is to contribute to the development of analytic devices for the study of whole schools as social systems. To accomplish this there will be selective uses of educational research, but there will not be a comprehensive report on educational research literature. Such reports exist already (Gross, 1959; Charters, 1952; Havighurst and Neugarten, 1962); our guiding principle is strengthening conceptualization of social processes in the school, rather than the integration of all existing research efforts.

The entity on which we focus is the school, seen as an organized system of activity. This unit is a complex social organization. It is complex in the sense of including many different persons in interaction who perform many different functions. It is a "social organization" in that the participants are interdependent and their actions are socially promulgated and enforced. The study of complex organizations is currently receiving much attention by sociologists, political scientists, and others concerned with the study of large-scale administration of human effort. Various formulations which have

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emerged from these studies can be applied to the analysis of schools. Schools share organizational characteristics with factories, social work agencies, and military units; but they also have unique aspects. Yet, even consideration of the uniqueness of the school will add to knowledge not only of schools but to that of complex organizations, provided the consideration proceeds in a sufficiently analytic manner. This is opportunity. We do not believe that the present formulations concerning the structure of complex organizations are at all adequate. A primary task of this paper is to attempt to strengthen the existing formulations. This effort is regarded as a venture in development of theory. For this reason we shall not be satisfied with merely applying existing sociological theories of complex organizations to schools, but in the pursuit of conceptual clarification of schools, we shall try to advance complex organization theory itself.

This paper focuses largely on the internal structure of schools. This implies purposeful limitations based upon the division of labor in the present undertaking. The school-in-the-context-of-society is a concern in the paper by Wilson [Chapter II]. His paper has bearing on the present effort, but is not central to the perspective of the school as a total system. Similarly, teacher-pupil interactions and classroom transactions have bearing to the total school system, but are not identical with the focus of the present paper.

There is yet another self-imposed limitation. Our use of formulations from the complex organization literature will be deliberately selective. As in the case of existing educational research, our goal is not to integrate all existing research (as attempted by Blau and Scott, 1962; and Etzioni, 1961a), but to augment and strengthen certain conceptualizations.

Complex Organizations

Sociological writings on complex organization invariably go back to the work of Max Weber. Weber's historical and analytical studies of bureaucracy have provided the core formulations regarding the social structure of complex organizations sociologists use to this day. Bureaucracy, according to Weber, is rational organization of human effort; members are chosen on the basis of ability to perform specific tasks; responsibility for accomplishing tasks is incorporated into established positions, each of which is systematically related to other positions (usually in a hierarchical arrangement). Responsibility and duties are "built-into" positions through a system of rules that specify the contribution of each position to the whole organization. Underlying the whole system, and providing the raison d'etre for all the rules, is the "mission" of the organization. For example, the mission in the case of a manufacturing concern is the production of certain goods at a profit to the owner. It was Weber's belief that bureaucracy was the most efficient and rational form of harnessing human energy that has yet been devised--paralleling the harnessing of physical energy by machines. Weber's work has given rise to a flourishing sociological speciality: The study of complex organizations.

It is porbably fair to say that recent sociological theories of complex organizations are a series of footnotes to Weber.[1] This is particularly remarkable in view of the fact that virtually all empirical studies of complex organizations have pointed to inadequacies in the Weberian model. With unfailing regularity studies of complex organizations have discovered "informal" activities--activities that were not included in the formal set of organizational rules of prescribed behavior and thereby constitute anomalies in respect to the Weberian model. Theorists have made grudging accommodations to such "informal" behavior. They have postulated the existence of _informal_ as well as _formal_ structures. The latter is comprised of the classical Weberian scheme of positions in rational linkage to basic organizational goals; the former, thanks to repeated empirical evidence, is regarded as inevitably occurring within complex organizations, but its theoretical status is entirely _unclear_. The early industrial studies by Mayo and his colleagues left no doubt that informal behavior was often patterned and socially "organized"--not merely idiosyncratic individual deviation. More recent studies by Blau have demonstrated that such informally patterned activity was often necessary for the organization's members to accomplish their part of the organization's mission--that informal patterns were functionally necessary and therefore related to formal structure. In addition, many studies have found that informal activity, far from augmenting organizational goals, may actually systematically curtail these goals. The best known example of this feature is control of production by workers.

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[1] This contrasts with non-sociological theories--notably Simon's decision-making approach to complex organization--which relegate sociological variables to a somewhat secondary place. (Simon, 1944 and 1950)

There is, as yet, no systematic and elegant formulation that links informal patterns to a comprehensive theory of complex organizations. There remains the conception, stated by Parsons but reflecting the Weberian model, that the "defining characteristic" of complex organization is the "primacy of orientation to the attainment of a specific goal" (Parsons, in Etzioni, 1961b, p. 33). In this conception there dominates a "decision-making process which controls the utilization of the resources of the system as a whole in the interest of the goal, and the processes by those responsible for such decisions can count on the mobilization of these resources in the interest of the goal" (p. 35). There is little place, in this scheme, for patterned informal behavior. It is, at best, deviant behavior. This state of affairs prevails despite the demonstration of the existence of system-supporting patterns by Blau.

Blau and Scott state that the distinguishing feature of formal organizations is that they are "deliberately established for a certain purpose," that they "have not spontaneously emerged in the course of social interaction, but have been consciously designed a priori to anticipate and guide interaction and activities . . . " (p. 5). The statement is probably an accurate declaration about formal organization. But, as in the formulation by Parsons, there is *overwhelming emphasis on a single goal and rational* organization to achieve the goal. Informal patterns are essentially peripheral categories.

Despite the formal system's marshalling of resources toward achieving a single goal, sub-units within large organizations exhibit tendencies toward autonomy. The informal patterns just noted are but one example; others will be explored in the next chapter. The strain toward autonomy has been most clearly recognized by Gouldner. He notes that the notion of "system" implies not only an interdependence of parts--since the parts have separate and distinct functional contributions to make (Gouldner in Gross, 1959, p. 253). He states, further, that organizations serve ". . . to link, control and interrelate parts but also function to separate them and to maintain and protect their functional autonomy . . . . " (p. 257). And that " the social system model. . . required for complex organizations must be such as to facilitate not only the analysis of the interdependence of the system as a whole, but also the analysis of the functional autonomy of its parts, and the concerte strain which efforts to maintain this autonomy may induce" (p. 256). In support of his contentions he cites Hughes's work on the quest for autonomy by occupationals, and Goffman's work on "avoidance" and "presentational" rituals (Hughes, 1951; Goffman, 1956). In this paper we shall take seriously Gouldner's admonition that autonomy patterns should be incorporated into a social system model of complex organizations. We shall go a step further and postulate that autonomy patterns are distinctly structures within complex organizations and can be the subject of orderly conceptual and empirical assessment. Also, we shall contend that some forms of autonomy are functionally necessary and therefore cannot be regarded as "deviant" action.

Outlining autonomy patterns in complex organizations, with reference to schools, will be the chief focus of the next section. It is hoped that this will provide a spring-board for subsequent empirical research and a broadened base for formal models of complex organizations.

Concentrating on autonomy structures constitutes an attempt to analyze deliberateely the diversification which makes up the school as a social organization

It is an effort to broaden the scope of organizational theory by departing from concentration on conformity[2] and the pursuit of a unitary goal. Formal structures will be treated only peripherally since we are trying to depart from the traditional dichotomy of formal--informal structure. A somewhat fuller exploration of the structure of schools will be attempted in the last section. We hope that this will provide a tool for lessening the much-discussed "statics" of structural analyses of schools (Charters, 1964).

Autonomy Structures in Complex Organization

This section is intended to provide a necessary supplement to the analytic scheme commonly used for discussing formal organization. Characteristics of formal organization--such as rational organization of tasks into positions, the organization of positions into hierarchical systems, the existence of a basic goal--are not being discarded. They are being augmented and, in some cases, modified.

"Autonomous" according to the Webster dictionary, refers to "self-governing ; without outside control." In our usage "autonomous" refers to independence by subunits of an organization, which makes these units essentially independent from control by an agency external to the acting unit--be it another subunit of the organization or the whole organization. The unit can include any subunit of the organization; for some purposes the entire organization may be regarded as an autonomous unit. The nearest parallel is the usage of autonomy in biology where, according to Webster, autonomous refers to "existing independently; responding or reacting independently of the whole." In the present context the "whole" is usually a complex organization, such as a school, a factory, a hospital, or a prison; but it can also be a community or society. Any kind of "independent" action can be regarded as being autonomous. However, we shall not be concerned with all autonomous actions occurring in complex organizations but only with those types which can be related to the social structure of complex social organizations--this excludes consideration of purely personal autonomy patterns. We postulate that there exist patterned forms of autonomy within complex organization which, by definition, exhibit independence from external control but, none-the-less, are part of the structure of complex organizations.

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[2] "Compliance" as an underlying feature of organizational theory and research has been most eloquently developed by Etzioni (Etzioni, 1961b).

Two functional bases for autonomy structure are investigated. A. Autonomy structure related to specialization. The nature of the objectives (including the tasks to be performed and the characteristics of objects being processed) produces autonomy requirements to enable the accomplishment of these tasks. These requirements devolve upon a) the individual functionary--who must have protection for the exercise of his specialized judgment and b) the whole organization as well as segments (e.g., departments) within organizations, since they, too, must have a protected scope for the accomplishment of their mission. B. Autonomy structure related to affiliations of members of the organization--including affiliations outside the "host" organization and affiliational variability inside the "host" organization.

The focus--both in A and B--will be on the manner in which autonomy is socially structured in relation to positions located in the organization. The scheme is as follows:

Structural forms of autonomy: How autonomy is specified for positions.

I. Autonomy is internal to organizational roles and is
  a. enacted in the organization.
  b. enacted outside the organization.
II. Autonomy is external to organizational roles and is
  a. enacted in the organization.
  b. enacted outside the organization.

In the next two sections of the paper the functional bases for autonomy will be discussed. In the section following, the above structural scheme will be more explicitly discussed and filled out. After that, an attempt will be made to relate autonomy structure to a recent survey of characteristics of the modern school. The important problem of how to measure autonomy--how to operationalize the concept--is not taken up in this study;[3] we expect to make this a focus of a later field study. In the present work we are assuming that autonomy is not an all-or-nothing entity; we frequently speak of degrees of autonomy.

Autonomy Structures Based on Specialization.

Specialization of tasks. It has been suggested that "the existence of [complex] organization . . . is a consequence of the division of labor in society" (Parsons, 1961, p. 34). That is, modern societies require considerable specialization in the labor that individuals perform, and complex organizations serve to coordinate the effort of such specialists. But if the division of labor has fostered the development of complex organization, it has also left its mark on the internal structure of these organizations. The organizations must permit the specialists to deploy their specialized skills. When the skills are relatively simple, such as the ability to tighten a bolt on an automobile frame that moves along on a conveyor belt, the formal instructions can specify fully and in detail the work which is to be done. When the skills are highly complex, such as the physician's task of diagnosing illness, the formal rules of procedure cannot be full and detailed; indeed, they must explicitly permit a considerable degree of autonomous judgment on the part of the physicians--including "the right to be wrong." Similar "rights" to professional autonomy are encountered in universities. The claims to autonomy are essential ingredients to utilization of highly specialized knowledge. Yet, this introduces dilemmas for administrative functionaires. They are not able to exercise close control over specialists, such as professionals, since they do not share their technical training, but rather have responsibility for coordinating the work of these people. As a result there exists a sizable literature on conflict between specialists seeking independence and administrators seeking dependable and calculable performance (e.g., "academic freedom" from "arbitrary" control by Boards of Education, etc.). It is a conflict between "substantive expert" and "administrative expert" (Gerver and Bensman, 1954). As Gouldner has pointed out, Weber's formulation contains the assumption that all runs smoothly in the bureaucracy, despite the inherent dilemma involved in the fact that ". . . on the one side it [is] administration based on expertise, while on the other, it [is] administration based on discipline" (Blau and Scott, 1962, p. 35-36). We suggest that the discipline of the expert must inevitably be balanced against a degree of autonomy. Concerning this balance, we offer a proposition: *The greater the degree of specialized knowledge and skills required of the incumbent of a position, the greater the degree of autonomy that accrues to the position; or, the greater the degree of specialized knowledge and skills required of the incumbent of a position, the less discipline is exerted over the position by the administration of the organization.* But we must note that the proposition refers to a role where autonomy is *internal* to organizational membership; we cannot claim that our proposition would hold for a role where autonomy is external to organization membership (see page 200). Rosenblatt has also suggested a related proposition, based on ego's utilitarian contacts with others: the less assistance available (from peers, for example) the greater the autonomy which accrues to a position.

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[3] Similarly ignored is autonomy as a component of personality structure. (See Bettelheim, 1960).

An additional facet of the specialist-administrator situation related to autonomy. The administrator may also be regarded as a specialist, whose "specialized" task is the coordination of effort within the organization. Coordination is a sphere of responsibility which can readily be intrusive to the autonomy of technical specialists. In the school, for example, administrative responsibility includes coordinating the teaching by different instructors so that transfer of students and movement of pupils from grade to grade are accompanied by a minimal amount of frustration to children and disruption to the school. This requires restrictions upon the autonomy of individual teachers. In short, the coordination of activity--which is the special task of administrators--is inherently intrusive to the task performance of the remaining specialists. And yet, as Chester Barnard (1946) has pointed out administrative activity depends heavily upon the willing participation of subordinates.

The school's most numerous technical specialists are the teachers. They operate under an administrative regime of non-specialists (the School Board) who set administrative policies. The Board delegates authority to persons with specific educational training to carry out the teaching; the size of schools and echelons in which they are organized varies with the size and social character of the community. In the lower echelons--that of teachers--the specialized task of teaching is performed. It is here that the lowest degree of administrative power is enjoyed (concerning the ability to influence the total organization), and the greatest technical specialization exists; yet, this connection requires autonomy. How is teacher autonomy structured? In this connection there is relevant Etzioni's typology of organization based on the distribution of charisma within organizations (Etzioni, 1961a, Chapters IX and X). He defines charisma as "the ability of an actor to exercise diffuse and intense influences over the normative orientations of other actors" (p. 203). His typology is focused on positions that utilize charisma within organizations. The types are:

T-Structure--Charisma is concentrated at the top (as in the Ford Motor Company under Henry Ford)

L-Structure--Charisma is present in all line positions (as in the Roman Catholic Church)

R-Structure--Charisma is concentrated in one or more ranks, but not at the top (as in hospitals and universities).

He regards schools as combining aspects of R and L structures: Charisma is not clearly located at the top; it is located in the ranks of teachers, and there are heirarchical distinctions (L structure); but it is not focused at the top (R structure). It appears to us that this distribution of charisma can be regarded as functionally equivalent to the structure of autonomy. Stated differently, it is a way of structuring task-centered "elbow-room" for teachers by having charisma potential in the teacher position. The early formulations of the concept "charisma" focus on the personal characteristics of the charismatic person--namely, his ability to gain a personal following, to disrupt established routines, and so forth. The model was the religious prophet. Our usage, following Etzioni, dwells on the potentials for charisma that exist in certain social positions; not every occupant of such positions is "charismatic," but the potentials *inhere* in the position as it is socially defined. Charisma, in this case, is a *particular form* of structuring autonomy, with particular consequences for the organization. Notably, it can dilute the power (and autonomy) of those in higher echelons.

The presence of charisma in the middle ranks can prove effective as countervailing forces to the superior power position of the administrative elite.

The teacher with a large, personal following among pupils has obtained a weapon (through her charisma) in dealings with administration. This has been well illustrated in studies of hospitals--in the struggle between physicians and hospital administrators (Smith, 1955). In terms of our concepts we can offer this proposition: In organizations where charisma is concentrated in the middle ranks, the greater the charismatic power in these middle ranks, the smaller the sphere of power in the top ranks. (When charisma also exists at the top, there obviously is no countervailing power between middle and upper ranks; e.g., in the Roman Catholic Church a priest can hardly utilize the intensity of his personal following in problems with his bishop.)

In addition to specialization based on position and rank, complex organizations require considerable specialization on a larger scale, especially "departments" and "divisions." While such units are formally established in order to integrate and coordinate activities in the organization they also, at the same time, constitute functionally distinct entities. To our knowledge the "segmentation" involved has not been systematically studied, although it has been alluded to theoretically. (Selznick, 1949, p. 6; Williams, 1960, p. 504). There have been studies of "strain toward autonomy" in specific departments in complex organizations--notably conflict between "line" and "staff" departments in industry, where each seeks to preserve a degree of autonomy of action by protecting itself from "encroachment" by the other departments (Dalton, 1950). The two types of departments have different functional assignments: the "line" is attuned to orderly production of goods; the "staff" is geared to research and introducing new products, discovering short-cuts in operating procedures, etc. In an overall sense the two functions are, of course, complementary. But in day-to-day operations they are often antithetical and, organizationally, require "protection" from each other if each is to preserve enough flexibility to assure accomplishing its functional mission. For example, "staff's" readiness to introduce "short-cuts" becomes disruptive to the need for predicatbility of the line in turning out products. Conversely, staff must be protected from insistence on immediate concrete results required by line problems if it is to preserve its mission to innovate and discover new products and methods of manufacturing them. In short, we are suggesting that differentiation of departments in complex organization implies not only different functions in respect to the total organization (this has long been recognized) but also autonomy requirements if these functions are to be accomplished. This can be formulated as a basic proposition: *Accomplishment of functional contributions to a system requires a degree of autonomy from (control by) that system.* This proposition presumably holds even when the contributing agency is a subunit of the beneficiary system and for both social and non-social systems.

We can hypothesize that when departmental quests for autonomy involve interaction between units that are on the same echelon--that is, neither department is clearly stipulated to be superordinate to the other--then the organization must provide protection for the autonomy of each department; otherwise the departments will, themselves, establish ways of protecting their functionally necessary autonomy. In the school such devices as the institutionalization of time periods for particular subjects and separation of classes into rooms are ways of protecting teachers and their pupils from encroachments. These, therefore, constitute protection for a degree of autonomy from other pupils, other teachers, visitors, etc. When functional specialization involves units which are on different levels in a hierarchy, the difference in power can be relied upon to protect the higher from encroachments by the lower unit (Sheer power need rarely be invoked when it is known to exist). But safeguarding autonomy of a subordinate unit from a superordinate one calls for social inventiveness that must often be sub rosa; methods must be used which don't involve open confrontation with the superior. The literature and folklore on bureaucracy is replete with examples of such efforts. Merton's "retreatism" is probably a favorite device (Merton, 1957, pp. 131-160).

In regard to functional need for officials to protect themselves from their superiors, Lipset writes (in regard to civil servants):

> A department official is not only interested in whether a minister's proposals can be effectively put into operation, but must also be concerned with the effect of such policies on the traditional policies of the department, and long term relations of the department with other groups in the government and in the community. . . .
> . . . A reform which may be socially desirable, but which disrupts the continuity of practices and interpersonal relations within the department, will often be resisted by a top ranking civil servant. He is obliged to protect those beneath him in the administrative

hierarchy from the negative consequences of change in policy (Lipset, in Etzioni, 1961b, p. 264-265).

Few empirical studies have been made of autonomy patterns among organizational "elites." (Most studies of "informal behavior" deal with persons at low echelons.)[4] Our remarks on this topic, are therefore, largely speculative. It would seem that work obligations are usually stipulated in less detail when they are at lower levels. This has implications for autonomy patterns. At high levels the very prescriptions regarding expected behavior leave greater scope for autonomy within the formally structured role than they do at lower levels. Autonomy at the top is not as readily defined as "deviant behavior" than is autonomy in the lower ranks. It is therefore less "visible" to researchers. This suggests that autonomy may be clearest when compliance rules are most clearly stated. The high degree of autonomy at top levels requires incumbents of positions to set their own limits to a far greater extent than those at low levels. For the latter, the organization itself sets more limits--such as work hours, place of work, as well as pace of work.

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[4] However, there exist suggestive ideas in the work of Chester Barnard. Barnard, who was himself an executive, poses a conception of administration that allows considerable autonomy among rank-and-file members. He notes that conflicting loyalites are unavoidable (Barnard, 1946, p. 100 ff.) and that the indivudual's "willingness to serve" is a crucial item in the organization's structure. He also notes that administrative functions are served by executives being involved in informal instruction: they have access to information without having to act officially on this information. Executives have access to "communication of intangible facts, opinions, suggestions, suspicions, that cannot pass through formal channels without raising issues calling for decisions, without dissipating dignity and objective authority, and without overloading executive positions" (p. 225).

The progressive education movement was presumably geared to maximizing autonomy potentials of the child. Among the dilemmas which emerged, and which are relevant to our topic, are: "How much autonomy?" or, "When does autonomy degenerate into utter intractability or revolt?" In the context of an organization (as in the context of the individual person) these possibilities set a limit to the amount of autonomy that can prevail if the organization is to persist. We would expect that the debate over the optimal degree of autonomy for the child is often resolved, not on the basis of idealogical preferences, or the needs of the child, but on a limited tolerance for autonomy within the organization in which the child exists (family, school, community). This can also be regarded as the control of entropy by the system.

In addition to internal features making for autonomy, whole organizations inevitably have a degree of autonomy from the rest of society. If this seems too obvious to amplify, the reader is reminded of the current emphasis upon the "impact of society" on the family, on schools, on businesses, and so forth. Yet, such organized units as the family enjoy sizeable guarantees of autonomy (Goode, in Merton and Nisbet, 1961, p. 393); there is protection against intruders--the physical intruder into the family's homestead as well as the affectional intruder into intra-familial ties ("alienation of affection"). This autonomy is guaranteed by law and custom.

Autonomy patterns of the whole school are particularly important. Illustrative of the "impact of society" focus, studies have shown the influences of pervasive middle class values upon teacher behavior and the impact of community power structure and stratification upon schools (Hollingshead, 1949, Havighurst and Neugarten, 1962). According to this view, schools are but pawns in the hands of community forces--at the mercy of school boards made up of business and social leaders of the community, harrassed by middle class dominated PTA's, and infiltrated by teachers and administrators who have been brainwashed by their own training and their own mobility aspirations into middle class society. Recently these views have been challenged, (Charters, 1964) though no firm research appears available to indicate tactics and strategy of schools toward preserving a degree of autonomy. It is hoped after a period of focused research, one may be able to develop a typology of "autonomy strategies" which apply to the whole school vis-a-vis community, as well as to internal technical specialization.

Specialization of objects being processed. It is a premise of this study that the characteristics of the object will introduce autonomy requirements--for the organization that is its processing agency, as well as for the object itself. In the case of the school, the "objects" being processed are human beings with certain characteristics. For example, the education of these humans is to be promoted in the school, but education neither begins nor ends for them in the school. This introduces functional requirements, including autonomy requirements. If the objects are not human beings, this will also introduce autonomy requirements. But this is beyond the scope of the present discussion.

We turn first to a discussion of the necessity for autonomy of the school. Let us expand the above statement--that the child's active learning and socialization is promoted in the school, but that this process has begun before the child reaches the school, will continue after he finishes school, and that during the years the child is in school there will be learning and socialization influences upon him other than those of the school. For the school, this means functional interdependence with these other agencies of education and socialization--with families, peer groups, higher education organizations, and occupational organizations. The school must, somehow, provide continuity with early family training; it must demonstrate that its efforts have usefulness for continuing with higher education and adult occupational requirements; and it must have some "fit" with the child's contemporary world. But if the school is to perform a specialized function, it is our hypothesis that there must be a degree of autonomy from these other agencies; the "conjunction" with these agencies must be balanced by a degree of "disjunction." To clarify this hypothesis, let us entertain the question: What is the special function of the school that calls for autonomy from the child's family and community?

Probably a most basic feature is that the school's relation to the child is primarily that of cosmopolitanizing agency. It is an agency that weans its object from the local context by making it adaptable to a larger context. The child is not taught to add up the family bills, it is taught to add; it is not taught to read the family's mementos, it is taught to read. Even where local participation is encouraged by the school, this is likely to be done in the name of a larger perspective: Pupils and parents should participate in elections because elections are important in preserving the existing political system--not just because candidate Jones promises more roads for the county than does candidate Smith. Since cosmopolitanism is, by definition, at odds with localism, the school requires a degree of autonomy from local pressures if it is to accomplish its cosmopolitanizing tasks.

In addition to pressures from external sources, schools are subject to internal threat from their objects; this also creates requirements for autonomy. Since the objects are humans, there will necessarily be social relationships between objects and members of the processing agency. This is likely to produce tendencies toward relationships that might encroach upon the school's mission: The "permanent" student, the overly affectionate student the overly alienative student--all these produce threats to the school by interfering with the teaching process. Schools, like other organizations that have human objects, tend to preserve their mission by promoting a degree of autonomy of the organization from its objects. This tends to take the form of distinctive role definitions: there will be differentiation between the "transients" and permanent members of the organization--between pupils and teachers of the school, just as between customers and clerks of the retail store, and between client and bureaucrat of the employment agency. Transients will be discouraged from permanent affiliation with the organization. Persons occupying "permanent" positions will be encouraged to act universalistically and curtail particularistic actions toward transients. Thus, the store clerk is expected to treat all customers courteously and not to grant favors to one customer which he would not be able to grant to other customers; teachers are expected to show no preference or "personal liking" to a particular pupil while neglecting other students. The universalistic emphasis aids in rendering a service while keeping the transient at "arm's length" from involvement with functionaries of the organization. However, within the prescribed section of behavior--i.e., within the sphere of universalistic actions--considerable independence is often permitted. The teacher may sit or stand while she leads her class; she may read children's grades aloud or tell each child his grade separately. But there are limits to her independence. The limit on which we are dwelling is set by particularistic behavior. As long as she does not enter into the tabooed sphere of particularistic behavior she is at liberty to be independent. In short, the organization is exercising autonomy vis-a-vis its human objects. This is a functional necessity.

Children, too, have a requirement for autonomy within the school. They have characteristics that require explicit safeguards. One of these characteristics is that children are the beneficiaries of professional services; on this basis there are presumed to be areas in which their interests are better understood by the professionals than by the children themselves (Blau and Scott, 1962, p. 51 ff.). In this respect children are in the same position as other clients of professionals, such as medical or legal clients. The relationship between professional and client is essentially asymmetrical: The client comes to the professional for help; the professional has superior knowledge in the area of the client's problems; the client is a poor judge of his own needs. In the well established professions the autonomy of the client is safeguarded by normative components in the professional's role: The professional is expected to be disinterested (not to "take advantage" of the client), to be rational in his approach to the client, and to separate his own emotions from his task. These points are, of course, based on Parsons' writings (Parsons, 1957, Ch. X). It may be hypothesized that without some institutionalized protection of the client's autonomy neither the role of "client" nor the role of "professional" would be likely to receive acceptance and permanence. A related hypothesis is that if an asymmetrical role relationship is to persist, under non-coercive conditions, there must be guaranteed a degree of autonomy for the "weaker" role participant. The assumption is that autonomy guarantees for the weaker role serves to give permanence to the two respective roles by normatively removing temptation from the professional and emphasizing the rational deployment of his skills.

It is of interest that even though the teacher role lacks some of the prestige of some of the "high professions," it does, nonetheless, incorporate the autonomy guarantees for the client, the child. In addition to being a "client," the child's "weak" status is further accentuated by the fact that he is regarded as a legal minor. This, too, potentially invites gross disadvantages for the child. Here also, there are structural guarantees to the child's autonomy: A major one is that teachers, and other school personnel, are regarded as quasi-guardians of the child--at least during school hours. (To our knowledge, this has not received attention by researchers.) Also, the child's other guardians--notably his parents--have access to the school in various ways, for the purpose of protecting their child's interests.

This by no means exhausts the topic of autonomy structure in relation to specialization. It is hoped, merely, that a meaningful introduction has been given to autonomy patterns as outgrowths of those specialization which develop into full-fledged institutionalized structures.

Autonomy Structure Based on Affiliations

It was suggested that the division of labor in modern society gives rise to technical specializatinn; and this, in turn, requires functional autonomy patterns in complex organizations. Another resultant of the division of labor is that individuals are implicated in multiple relationships and multiple commitments: They are, simultaneously, members of many social organizations. An important corollary to this is that individuals do not necessarily have a major commitment to each relationship in which they are implicated. This

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proposition has been studied in relation to career choices--where it was postulated that persons may choose an occupation and actually become members of the occupation without having made a subjective commitment to that occupation (Katz and Martin, 1962). A similar perspective, in regard to participants in complex organizations, underlies this section of the present paper. We shall view variability-of-member's-allegiance to an organization as an aspect of concrete structures. Variation of allegiance to an organization can be seen in social structural terms--not merely as deviant behavior. Similarly, cross cutting affiliations--based on Parsons' conception of cross cutting solidarities (Parsons, 1959)--can be treated as structural elements. We shall introduce this latter topic first.

Cross cutting affiliation. Most complex organizations must adapt to the fact that their functionaires have active group affiliations beyond the confines of the organization. (Exceptions exist, however; for instance, monasteries--where outside affiliations are permanently severed, and prisons--where outside affiliations are temporarily severed.) Some of these affiliations, such as family and community ties, do not necessarily affect the organization. But there are affiliations, such as union membership of workers and membership in professional associations by specialists, that may constitute distinct rivalry to exclusive commitment to the organization in which the individual works. Such affiliations may exist within an organization and yet constitute a degree of autonomy from the "host" organization. Thus, fraternities and sororities in colleges and high school are sometimes regarded as alien to the host organization. Coleman has recently suggested that the adolescent subculture constitutes a "distinct community" within the high school (Coleman, 1961). Concerning professionals, there have been studies of the extent of affiliation with the "host" organization, and the typology of "cosmopolitans" and "locals" have been proposed (Gouldner, 1957). Cosmopolitans are primarily committed to affiliations beyond the host organization in which they work; "locals" are primarily committed to the host organization. The term "cosmopolitan" tends to obscure the fact that the professional who is labelled this way may be strongly integrated in an organized collectivity of his professional peers. This collectivity cross-cuts the boundaries of the "local" organization and is, therefore, not always tangible to other members of the local work setting.

The theoretical issue is that most complex organizations are not self-sufficient "communities." Complex organizations are specialized structures. They serve particular functions and are, thereby, interlocked with other structures. Using schools as an example, the organization is "in business" to prepare children for active participation in adult activities and must, therefore, allow them a degree of independent activity. Yet the school runs the risk, in permitting students a degree of autonomy, that some of the cliques, clubs, and so forth will be directly hostile to the school-as-a-going-concern. Again, schools require teachers who are competent to teach and stimulate students. But teachers' technical competence requires contact with other teachers and schools of education in order to keep up with advances within their field. Such contact may give rise or heightened concern or "professionalism"--such as the desire to elevate the status of teachers and to be permitted to innovate new teaching methods. This, too, can become a threat to schools in that it is liable to emphasize teacher autonomy against teacher compliance with existing school constraints.

In each of the preceeding aspects the school is committed to permitting members to maintain affiliations that are potentially dangerous to the school. Each involves a degree of autonomy for organization members, yet schools cannot cut off these outside affiliations because the "life-lines" of its own interdependence with other structures would, thereby, be severed. Hence, the school does not, *in toto*, have unfettered autonomy; instead, it permits autonomy of a series of its compotent subunits. This points to an organization model that focuses on divergent allegiances among its member units rather than a unitary system that is centrally controlled.

Affiliational variability to the host organization. The previous section implicitly raises the issue of autonomy in regard to compliance with organizational goals: How much divergence from goals is permitted: let us reiterate that a "specific goal" is often thought to be the basic characteristic of an organization (Parsons in Etzioni, 1961b). We are not concerned with behavior that deviates from organizational rules and goals and is regarded as *unacceptable* behavior. We *are* concerned with a) *patterned* behavior, which b) *departs* from prescribed behavior, and c) is regarded as *acceptable* to the organization.

Firstly, it has long been recognized that role compliance is rarely absolute--and not expected to be; a degree of "leeway" is permitted to most role incumbents. This leeway is particularly distinct when the actor can demonstrate strong involvement in an approved goal: The janitor can order the company president out of his office in order to prim the office for an important visitor. The janitor is clearly overstepping the bounds of his position, but he is proclaiming his concern with the company's impression on the VIP. Long-time employees are occasionally permitted similar leeway. They are often regarded as the very embodiment of the organization's traditions and, on this basis, are permitted idiosyncrasies and divergence from expected behavior for which a more junior person would be punished (e.g., coming to work late; among old professors, forgetting to meet classes). In short, we can offer the proposition that actors' strong commitments to an organization and its goals tend to be accompanied by autonomy privileges. We refer here to commitment that is attributed to the actor; the actor may not actually, subjectively, have such a commitment. Usually such a commitment is taken for granted for holders of "elite" positions--executives, and positions of leadership at every level; and these persons usually enjoy greater autonomy than those under them in the hierarchy. This is presumably based on functional requirements for flexibility among policy-makers. Persons at low levels, such as janitors, can occasionally enjoy autonomy privileges. But we suggest that such persons must explicitly demonstrate their commitment; their loyalty to the organization and its goals is not as readily taken for granted as that of elites. Here is a distinction between ascribed and achieved autonomy. At the high echelon, we hypothesize, autonomy is incorporated into the position itself and does not have to be achieved by the incumbent, apart from "achieving" the position.

At the other extreme, that of low involvement with the goals of the organization, there also exist autonomy patterns. Well-known studies of informal work groups exhibit these patterns. From the time of the Western Electric studies (Roethlisberger and Dickson, 1939) the main explanations of informal work groups has been based on their control of output, on workers' efforts to protect their economic self interest: "If you work too hard you'll produce so much that the company will begin to lay people off or the company will raise output quotas. Therefore it is best to keep production down." This was the main focus of explanation by social scientists. The finding that, occasionally, informal work groups acted to boost production did not shake the conviction of the researchers: Work groups were still, informally, regulating output.

It is our contention that the economic-self interest theme may be an inadequate explanation. Notably, it virtually ignores the fact that output control--where it does occur--is but one element in a context of behavior which is virtually a "subculture" within the confines of the complex organization. The studies of informal behavior treat the wealth of innovated activity--the bantering and joking, the patterned interaction--largely in terms of the individuals' work performance. (This holds even for the sophisticated research of Blau.) We suggest that there frequently exists, in such work groups, entire subcultures which have evolved in the organization but which have distinctly patterned structure of their own (stratification, rewards and punishment systems, socialization patterns for new members, goals, and so forth). We propose the views that these structures are only minimally attuned to work and membership in the company. The task assignments set by the host organization are conditions to which the system adapts, but it is not necessarily the core focus of its structure. The core is a socio-cultural pattern of relative autonomy from the host organization. Suggesting that informal groups tend to be relatively autonomous systems does not mean that autonomy from the host organization is necessarily the focus of action. The focus is likely to be features of the bio-social characteristics of members that prevail outside the host organization. In male working class groups, for example, sexual prowess is usually a major focus of verbal interaction. In terms of our autonomy role classification, workers are experiencing autonomy that is regarded as external to their occupational role, but they are enacting it in the organization in which they work.

Our formulation is perhaps nowhere better illustrated than in Roy's classic article on "Banana Time" (Roy, 1960). In this paper Roy vividly describes a four person work crew engaged in extremely routine labor. He pictures patterns of action--joking sessions, banana eating time, etc.--which have become a dominant part of the daily routine of the four men. But Roy shares the traditional focus of explaining his data on the basis of its functions in regard to work. The patterns of action serve to destroy the utter monotony of the work and thereby make it bearable and even enjoyable. We are suggesting that his data provides far greater insights; they describe a sub-culture, a relatively autonomous little group existing amid a factory and manifesting many of the structural features of an entire social system.

One question remains: Why does the host organization permit the worker "subcultures" to exist? Three answers may be tentatively offered to this question. One, the administrators of the host organization are not aware of the existence of a "subculture" in their midst. They see only workers who "kid around a lot, but get their work done." They are not aware of the patterning involved in the "kidding around" or the complexity of the relationships that exist in the activities. Two, they do not perceive the structures to be subversive to the host organization. Ordinarily, in the course of day-to-day activities, there is no direct, open antagonism to the host organization, and consequently the subculture is not regarded as dangerous to the organization. Three, worker subcultures are seen positively, as useful to the organization. Peter Blau has amply demonstrated how patterns of consultation and tension control exist in informal groups and how these may aid in accomplishing officially prescribed tasks. The extent to which this is recognized by administrators is not certain; Barnard's work suggests that administrators are not ignorant of it (Blau, 1955; Barnard, 1946). The two last answers imply our earlier formulation--that the activities, while exhibiting divergence from organizational prescriptions, are regarded as extraneous to the worker's role in the organization.

Summary

We are suggesting a perspective of complex social organization that deliberately focuses on diversification. "Diversification" is an idea that brings to mind the popular journalistic picture of the amorphousness of modern society--with its "diversity" of reference groups, values, and leisure and work pursuits, its lack of integrating mechanisms and commonalities. In its lack of order, such a picture is humanly frightening and scientifically dissatisfying. Our concern is with the second of these aspects. The scientist strives for orderly description, even when chaos confronts him; indeed chaos is a special challenge to his thirst for order.

In the work of Emile Durkheim there exists the rudiment for a model that treats diversification as a central phenomenon. His conception of modern societies is one of much specialization--division of labor--which requires a close "organic" form of interdependence of parts. We take this conception as our starting point as we strive for a model of the complex organization which focuses on the divergencies which co-exist in social organizations. We have claimed that there are various functional requirements that necessitate autonomy--independence from external control--within organizations, as well as by organizations in toto. We shall further claim that these autonomy patterns can be conceptualized as structural parts of positions and of aggregates of positions. By aggregates of positions we mean a multiplicity of positions that share one or more characteristics. Thus, the positions of second grade teacher in a particular school are a position aggregate. All positions in a particular organization can also be regarded as a position aggregate, since membership in the organization constitutes a common characteristic.

Autonomy was formulated in terms of types of role specifications for positions, as follows:

I. Autonomy is internal to organizational roles and is
    a. enacted in the organization
    b. enacted outside the organization

II. Autonomy is external to organization roles and is

a. enacted in the organization

b. enacted outside the organization

By autonomy being "internal" to one's organizational role we mean that there is a sphere of autonomy which is regarded as an intrinsic part of the role incumbent's contribution to the organization. By autonomy being "external" to one's organizational role we mean that there is a sphere of autonomy which is regarded as extraneous to one's organizational role. The business executive has duties in the area of policy formulation. He also has a degree of autonomy in this sphere which is regarded as a legitimate part of his role in the organization (internal autonomy). This autonomy is exercised in the organization, in the course of his day-to-day work. But the executive's role is usually so defined that even when he leaves the company building he still remains the organization's representative. When he plays golf at the country club, when he promotes a charity campaign in the community, when he sits on the local hospital board of trustees--he still remains in the role (his "master role") of company executive; and on this basis he continues to enact his organizational role, including both compliant and autonomous features. The executive's role is broadly defined in a special sense. Within the organization he has a broad sphere of autonomy as part of his official role. Outside the organization his autonomy is also substantial, but it is limited by his organizational membership; he remains "in" the organization even when he goes to the country club. Thus his autonomy external to the organizational role is narrow.

The "autonomy profile" of the specialist looks different from that of the executive. The specialist--the research chemist, the tool-and-die-maker--has a limited sphere of autonomy within his organizational role; in his specialty he may have considerably autonomy but not beyond it. But his peer connections, especially if he is a member of a well-developed profession, can assure him of a considerable sphere of autonomy that is external to his organizational role but is enacted in the organization as well as outside it. For example, the famous research chemist will be allowed to devote himself to following out his own hunches, even if they are not immediately related to production processes. He will be allowed time off to attend professional meetings, and so forth.

We have suggested that low-ranking, unspecialized personnel will have fairly limited amounts of autonomy internal to their organizational role, but broad autonomy external to their organizational role. (The two are not necessarily mutually exclusive unless one assumes that there is an absolute limit to combined external and internal autonomy; we see no need to make this assumption.) The external autonomy is partly enacted in the organization ("informal groups"). The above hypothetical profiles can be summarized as suggested in Table 1.

HYPOTHETICAL PROFILES

	Internal Autonomy		External Autonomy	
Place of Enactment:	Within the Organization	Outside the Organization	Within the Organization	Outside the Organization
Executive	extensive	extensive	limited	limited
Specialist	medium*	limited	extensive	extensive
Laborer (unskilled)	limited	limited	medium**	extensive
Pupil (vis-a-vis teacher)#	limited***	limited	limited****	extensive
Teacher (vis-a-vis pupil)#	extensive	limited	limited	extensive

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#See next section

*Specialist's autonomy tends to be extensive in a narrowly defined sphere; also, the specialist's autonomy depends on the extent of professionalization in his field.

**This includes the bantering and joking which has so often been reported about workers: autonomy exists in a narrowly defined area, but evidently quite intense in the area in which it is permitted.

***We have noted the normative "safeguards" for the pupil; but he is nonetheless in a weak position vis-a-vis the teacher. Items about pupils and teachers will obviously vary in different types of schools; our classifications are based largely on Clark's statements about the recent picture in American education (1962).

****In small communities the child's external status, expecially his family background, has traditionally influenced his school status considerably (which would justify an "extensive" autonomy classification); but recent increase in school size and "routinizations" de-emphasize the child's external status.

Autonomy and Education in the Expert Society

Introduction

In this section we shall relate the conception of socially structured autonomy to some general aspects of modern American education. The basis will be points raised by Clark's survey of the character of modern education (Clark, 1962). In the previous sections autonomy was postulated to be a fundamental element of the structure of complex organizations, including schools. Now we shall examine the relevance of autonomy to some of the ongoing processes in schools under contemporary conditions. The treatment will be brief, since the purpose is to indicate the relevance of the theoretical orientation to a variety of concrete issues--rather than an exhaustive treatment of any one issue.

Americans have great faith in education. Yet there is dissatisfaction with the existing educational machinery. Indeed, there is turmoil concerning contemporary American education, and schools are caught in this turmoil. Broadly speaking, the traditional functions of educations remain--the perpetuation of the social heritage and the teaching of basic skills to the young. But there is increasing recognition that education is the primary tool for enabling man to participate in the modern world and that educational procedures and content should be geared to this challenge. Modern societies increasingly require technical experts; and the educational system is expected to produce these experts. At a time when new fields of technology are springing up at a rapid pace it is inherently difficult to produce the new experts by social establishments whose wheels grind slowly and whose staffs are themselves inadequately trained in the new technologies. A major feature of the technological world is the fact that, at an ever accelerating pace, it is *changing.* New experts are in demand, and old experts become obsolete--with great rapidity.

Such issues, wrapped in international political rivalries, are behind the flaming debates over education. Following decades of emphasis on producing sociability, specialists there have been re-awakened interests in teaching "hard" subjects to produce experts who can man the technological posts. The debates dwell on virtually every aspect of education--the content of school curricula, teaching methods, as well as school administration. While the issues raised are far from new, there has been injected into the fray an ingredient of urgency and seriousness missing in the previous decades; this allows persons from many walks of life to join the battle and receive a hearing. For schools and, indeed, the educational machinery in general, this implies considerable buffetting and strain.

In seeking to understand this state of affairs the sociologist tends to reject the layman's glib concentration on the villany of the vested career interests by incompetently trained educators. He similarly rejects educators' pleas that they alone are competent to judge educational processes. Instead, he regards schools as systems that have inherited functional obligations which may not be voiced in the current debates but which are, nonetheless, embodied in the very structure of schools. Above all, in regarding schools as ongoing systems he looks for equilibriating and sustaining mechanisms. In the present analysis we shall address outselves to this topic by attending to our fundamental theorem--that an element of a system requires a degree of autonomy from that system if it is to make any functional contributions to the system. We shall, therefore, point to some processes affecting autonomy within schools.

Autonomy Processes Within Schools

The previous chapter was devoted to outlining autonomy dimensions that are characteristic of the internal organization of schools. In addition to these theoretically derived patterns, there exists a body of research findings on existing autonomous processes in schools. These may be roughly categorized as the "autonomous subcultures" and the "vicious cycle" phenomena.

Autonomous subcultures. Clark suggests that three types of subcultures are to be found in schools: 1) the fun subculture (emphasis on gay time and so forth), 2) the academic subculture, and 3) the delinquent subculture. From the perspective of teachers the academic subculture is the "serious" student element. Clark regards this subculture as being relatively weak if not largely absent. Absent, also, are the "rebellious intellectuals" who *are* present in colleges. But he notes that "no one has bothered to report on how high school students support one another in serious work" (p. 245).

Concerning the fun subculture, Coleman has studied value patterns among school students and has found that great emphasis on clothes, personal impressions, and cars are rated by children as highly important toward getting "into the leading crowd in this school"; in other words, popularity and one's reputation are extremely important. Having money is also important. For girls, social success is paramount--with emphasis on personality, beauty, and clothes; in communities where social success is tied to family background, the money of the family is also important (p. 247-8). Among boys, athletic success and good personality are rated high; on the basis of a study of high school girls, Clark notes,

> It is surprising that (academic success) does not count for more, because in some situations, the "stars," "heroes," and objects of adulation are those who best achieve the goals of the institution. For example, in the movie industry the leading crowd is composed of those who have achieved the top roles--they are by consensus the "stars." Or, in graduate school, the "leading crowd" of students ordinarily consists of bright students who excel in their studies. Not so for these high school girls. The leading crowd seems to be defined primarily in terms of *social* success: their personality, beauty, clothes--and in communities where social success is tied closely to family background, their money and family are important, too (p. 249).

and, "it is clear from all these data [that] the interests of teenagers are not focused around studies . . ." (p. 251). This holds even in well-to-do suburbs, where the high schools attempt to be academically oriented. In fact, frequently "special effort towards scholastic success may be *negatively* valued" (p. 252).

Coleman's study emphasizes the antagonism between values of high school students and the school. However, one needs to investigate whether the existence of divergent values--and adherents to these divergent values--*actually* implies the existence of social conflict, and, if so, the precise nature of such conflict; whether, for example, the fun subculture and the academic "supraculture" are not mutually supportive in some fashion. The study by

Gordon, cited by Clark, supports this latter view (as does Waller's earlier work). Gordon suggests that the athletic portion of the fun subculture serves certain interests of the school (p. 254, ff.). It is 1) a form of control of the student--by channeling adolescent energy away from tabooed areas, 2) it promotes school cohension (according to Waller, athletics unify the school by pitching the school against a common external enemy), 3) it serves as public relations for the school toward the community (the marching band and so forth), and it is a way of drawing the community into the school's affairs. "The local community typically 'participates' in the extra-curricular activities in ways it cannot--or has not--in the curricular (activities)" (p.255-6).

Many people believe in the existence of a general adolescent culture "that extends across the nation" (p. 256) and gives sustenance to the high school subculture.

> This youth culture has growing support from institutions which operate apart from the parent, church, and the school in shaping the young; the young are hooked into the mass media and their adjuncts, from nursery level television programs to the movies to the disk jockey and juke box. These means of communication leap over other forms of social contact in affecting the style and content of the general youth culture. Their effectiveness is shown in the national crazes that race through the homes and haunts of the teen-agers. The rapidity of communication and the adaptation with the subworld of the young can be baffling to their elders, and is another point of tension between the generations (p. 256-7).

This suggests that youth culture needs to be viewed as supra-school and supra-home systems. Indeed, it may be regarded as a type of community. Martindale, among many others, has pointed out that the "community" has undergone change, in the Western world (Martindale, 1960). He sees community as the "stabilization of solutions to collective problems" (p. 165, ff.) and documents the transition from rural-village, to urban, to national community. This orientation differs from that of scholars who see the passing of the rural, small community as the end of community: Urban, cosmopolitan, and national social patterns are seen, by these persons, as utterly diffuse and uncoordinated. By contrast, Martindale sees the emergence of different types of communities--the communities being characterized by different social structures. This idea was also approached by Katz in his concept of contact networks as forms of association which use mass communication as a means of contact with many persons without demanding extensive "primary" relationships with the contacted persons (Katz, 1958).

Similarly, the adolescent system may be seen as a "peer stimulation network" where there is contact without deep personal involvement--a system that is highly adapted to the speed and pithiness of content of mass communications. Such a network involves little harnessing of the communication pattern to traditional social positions and the "responsibility" which these entail, especially those of subservience to adults. We are suggesting that this peer system needs to be viewed as an autonomous system in its own right. It intrudes into the high school but is essentially divergent from it. We are therefore suggesting that the peer fun subculture in schools is not necessarily focused directly upon opposition to schools--being directly in conflict with schools. It is rather a separate subculture that is oriented to a different focus from the school; in other words, we are suggesting that the relation between the adolescent and the school is probably more nearly one of indifference, rather than hostile opposition. This is the same formulation we are offering for the working cliques, the informal groups in factories.

In contrast with the fun subculture, the delinquent subculture aims to be "avoiding or rebelling against the whole enterprise" (p. 263). "Most students who are seriously delinquent want to get out of school" (p. 262). There is active hostility to adults, to most other students; and there is challenge to authority. "They don't merely evade rules . . . they flout them" (p. 264). This creates discipline problems for teachers and is a threat to the traditional mandate of schools. Although it is obvious that teachers must see the action of these students as opposition to the school, it needs to be noted that the focus of opposition is obviously not the school but the adult world of authority that goes far beyond the school. In this sense delinquent subculture exhibit a quest for autonomy from the school, though the school is not the "core" enemy. When criminality is organized, as in juvenile gangs, we can speak of autonomous systems with fairly clearly formalized structure. These systems intrude into schools and, thereby, constitute the intrusion of external autonomy.

The Vicious Cycle Phenomenon

Laymen as well as social scientists have long known that some behavioral processes seem to perpetuate themselves from their own momentum--so that, once set in motion, a train of activity develops which seemingly cannot be stopped. Two sociologists, Thomas and Merton, have written about this phenomenon--Thomas dwelling on the "definition" of situations effecting human actions, and Merton refining this conception in an analysis of "self-fulfilling prophecies" (Merton, 1957). In somewhat more contemporary language one might speak of feedback systems which, under certain conditions, will produce a stability from which there is no escape; each element of the system serving further to stabilize the system. This is familiarly known as a vicious cycle. We believe that the autonomy concept will contribute to clarification of conditions that are involved in the stable feedback process of the self-fulfilling prophecy.

Perhaps the best known examples of vicious cycles in school affairs concerns the impact of social class membership. Traditionally, lower class persons have had negative attitudes about the importance of education (this may well be changing). These attitudes have led to efforts to drop out of school as early as possible; and the lack of education has, in turn, helped maintain the lower classes in the lower classes. More concretely, lower class childrens' lack of educational motivation has impact on their teachers. Teachers react negatively toward these children (Clark, p. 96)--they lose interest in these children and lower their aspirations for these children; this, in turn, fosters the lack of motivation of the children (97 ff.). Again, teaching in lower class neighborhoods is defined as unattractive and unrewarding by the middle class teacher (and middle class oriented teachers seem to dominate in American schools). Such attitudes are largely due to the cultural differences between middle and lower classes. For this reason teachers seek transfers to "better neighborhoods"; and as a result, the lower classes are perpetually saddled with inexperienced teachers (p. 99 ff.). This, in turn, perpetuates inadequate impact of teachers upon students in regard to serious interest in learning.

Each of the above action sequences is obviously a stable feedback system. Each involves the interplay of a series of elements in a fixed interrelationship. We are dealing with iron chains of circumstances that permit no break in the existing link to status attributes external to the school. Yet, it is a primary function of a system of democratic--equalitarian education to break such links. A raison d'etre of the school as a separate organization is the removal of children and teachers from their existing social contexts so that education can proceed in a setting that is relatively autonomous in its concentration upon educational functions.

From a practical point of view, the destruction of the vicious cycle involves the assertion of the autonomy of the school over that of the rival, cross-affiliational autonomies. Clark cites instances of schools being established for the purpose of deliberately emphasizing the dominance of academic subject matter (pp. 261-3). He gives findings which show that, with sufficient autonomy by schools, the rival autonomies can be counteracted; the lower class child can be as strongly motivated to do well academically as the middle and upper class child.

The Control of Schools

Schools are organizations that perform specialized services, and these services are of vital and immediate interest to many segments of the community. Inherently this condition carries dilemmas of how the school is to accede to external, community pressures while operating effectively as a goal directed social organization. On the basis of debates over "who runs the schools" (Gross, 1958) it would seem that there exist ill-defined optima of school autonomy vis-a-vis compliance with external pressures. How much autonomy must schools have to be effective as teaching centers? How much attunement to community pressure is necessary if schools are to be serving realistically their mission in a democratic setting? At which point will the school's loss of autonomy destroy its usefulness as a separate socializing agency? One would wish to condense these general questions into empirically manageable variables and conduct experimental studies. The object of such research would be to establish optimal autonomy specifications for various types of educational processes--just as the theoretically oriented engineer develops specifications for "tolerance" in mechanical equipment. For the present, however, it must suffice to dwell on existing--essentially qualitative--findings on control of schools.

Clark states that the "operational autonomy of schools" is a critical factor in educational performance. Whether they are active centers of innovation (so necessary in a changing, "expert" society) or "passive instruments of other institutions" (p. 40) depends heavily on their freedom from subservience to outside agencies. Clark further states that "the American public schools have relatively little independence since they are an exterme case of control by local citizens . . . the local control . . . renders the school heavily dependent on the wishes of the various political factions, churches, business groups, trade unions and the like that comprise the power structure of the local town or city . . ." (p. 41). This is likely to cause great dependence on local winds. The school is vulnerable to local pressures; it is "an accommodating institution" (p. 41).

We would suggest that there is need to study tactics and strategy by which schools manage to maintain a degree of autonomy amid the impinging pressures from the community.[5] This is a topic that probably has relevance to virtually every school in the country. In general, large schools may be expected to have more independence than small ones; the large school "has more resources at its command and the size of its staff and the complexity of its operations screen much of its work from the scrutiny of outsiders . . ." (p. 42). Clark suggests that there are three principles of authority which are present in American education. They are 1) Public trust: ". . . long a part of the American tradition (is the belief) that schools and colleges should be directed ultimately by community interests rather than by professional personnel or government departments" (p. 152). This has led to lay school boards being made up of part-time amateur educators who are public representatives. In turn, this vitiates against complete control by the state as well as education departments comprised of education specialists. It decidedly reduces the school's autonomy as a separate system. It permits the intrusion of outside forces into the policy making side of schools. 2) Bureaucratic authority: Lay boards "are removed from actual operation while officials--full time, expert, informed--are on the spot, making daily decisions" (p. 153). Much policy determination actually falls into their hands. Bureaucratic patterns of authority are increasingly used as schools get bigger and require expertise in their admistrative staff. Also, community board members may accept this model. Clark states that "many board members take a business firm (as the model) of how to organize the school or college. This conception stresses clear lines of authority and sharply demarcated jurisdictions for which officials are held responsible" (p. 154). 3) Colleague authority: In higher education this is quite traditional. It leads to strengthened control by the faculty and is probably increasing in the higher educational sphere. It implies a relatively low degree of power by the administration and emphasis on academic freedom. Clark feels that schools--grade schools and high schools--are increasingly tending toward the third type, namely, increasingly they too rely on large professional staffs and the teachers themselves are increasingly professionalizing. He states "there is now in the organization of education inherent strains toward greater conflict between the administration and the faculty" (p. 161). "Schools of the future are bound to hire more staff experts, to have a more diversified teaching force, and to give a larger place to counseling" (p. 164).

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[5] Gross' study of the lack of consensus regarding the school superintendency role is an example of the existence of potential cross pressures for schools (Gross, 1958a).

In previous sections we have emphasized autonomy requirements of specialists. The proliferation of specialists is likely to lead to corresponding proliferations of autonomy patterns within the organization of the school. When looking for an example of an advanced system of specialization, one invariably considers medicine. Here specialization and the accompanying autonomy of each specialist are well known. It is known, also, that this specialization and independence of the specialists can produce havoc for the clientele, namely the poor patient. In that sense there is often little coherence and integration among the various activities of the specialists. The corresponding danger of the pupil being divided up among the many specialists is an obvious issue to consider. At the advanced university level there exists a solution; the autonomy of the individual professor leads to discipleship or fairly permanent affiliation of students to particular professors. But this kind of system is a luxury based on a relatively high staff-to-student ratio. Unfortunately, such ratios do not exist in schools. Such "discipleship" facilitates personal attention to the student; for the student it also facilitates intellectual growth by providing access to one person's synthesis amid the existing diversity. Since school children have to learn the fundamentals of many fields, discipleship to a single specialist is undoubtedly impractical. Future school curricula might, however, adapt this pattern by assigning students to "area specialists" with whom they will have repeated contact over their school year--although the specialist does not teach each of the courses for his student charges.

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CHAPTER V

THE CLASSROOM AS A COMMUNICATION SYSTEM

Raymond S. Adams

Introduction

During its relatively short empirical history, educational research has come to develop conventions that set it apart from the other behavioural sciences. With no doubt commendable idealism, it has tended to concentrate on investigations designed with the express purpose of improving educational practice. The source of such a preoccupation stems from a long tradition of educational theorising of a normative sort. Its origins lie in antiquity, and its authority is vested in the stature of the great philosophers who have contributed freely to it. Education has acknowledged its debt to them by seeking practical means for implementing their theories. In the face of this earnest desire to improve the educational product, it is not surprising that much research has devoted its attention to the "output" of education. Understandably again, in the light of the rapid development of psychology in the early twentieth century, such research has focussed on the individual educand. Thus studies of learning-gain, in particular provide the hard core round which many investigations revolve. Learning too has achieved much attention as has its concomitants; motivation, intelligence, perception, developmental stages, and the like.

However, the relative single-mindedness of such approaches has begun to be called into question.

> "It is generally assumed, that effective ways of teaching can be derived from philosophical and psychological theories. It is often assumed that if we know how learning occurs, we thereby know how to teach. It is just as necessary to understand the phenomena of teaching as a condition of applying ideas and the principles to it, as to understand the principles themselves" (Smith and Meux, 1963).
>
> "The day is close at hand when we can no longer expose prospective teachers to some facts about individual differences, some theories of learning and child growth and development, etc. and let the entire burden of translating the knowledge into teaching action fall on the practice of teaching experience" (Flanders, 1963).

The quotations above reflect a certain dissatisfaction which stems from the manifest inability of earlier research to solve the very problems of "improvement" that were central to its concern. Unfortunately the solution that Smith, Meux, and Flanders offer seems merely to involve a change of viewpoint. The desire for improvement should merely be re-directed towards a presumably better subject: the teacher. Educational research is left with its reformative preoccupation unchallenged.

If the example of the other social sciences can be accepted however, it would seem that there is a better reason than misplaced emphasis to explain the inadequacy of earlier educational research.

The reason is to be found in education's failure to develop undergirding theoretical frameworks of a non-normative kind.

> "Much past research has been conducted in a theoretical vacuum, seeking ad hoc solutions to immediate practical problems....Many hypotheses have been based on an over simplification of the situation and have been tested by means of an inadequate methodology, leading to conclusions that do not make psychological or sociological sense" (A.E.R.A. Committee on Criteria of Teaching Effectiveness, 1953).

For in its search for a better world, educational research has shown a massive unwillingness to confront the realities of this one face to face. The phenomena of education remain largely unidentified. General laws are unrevealed, and empirically based explanatory theories of education have yet to be formulated. Prediction in any comprehensive way about the outcome of education is mitigated by the lack of relevant, supporting, and substantiating evidence.

What follows below is a description of one way of analysing the "realities" of one segment of the educational phenomenon. The work is theoretical in that it is concerned with the development of new analytical concepts and with the construction of a theory or model which accommodates and relates these concepts. The segment of education chosen comprises the behavioural setting of the classroom. The focus is on the communication transactions that occur there. Justification rests on the significance of the classroom behaviour setting as an important feature of the formal education system and on the acknowledged paucity of research in this area.

> "Little has been done to provide a framework of concepts that could be utilized to formulate and analyse, systematically classroom problems that are in some ways related to the social structure of the classroom group" (Jensen, 1955).
>
> "If we are to deal systematically either in research or practice....we must have an explicit framework within which to classify, relate and clarify the various phenomena under discussion" (Getzels and Thelen, 1960).

The Classroom as a Behaviour Setting

A classroom is a behaviour setting. Its personnel normally comprise a teacher and a number of students. Its artifacts, which may vary from chalk to cheese, are mainly relevant to the process of "educating" which is central to the functioning of the system, and which supposedly occurs continuously within it. This process involves interaction among the individuals who comprise the personnel. The express purpose of the process is to change the behaviour of the individuals who constitute the majority group (students), specifically in the areas of meanings (knowledge), norms, (socially sanctioned behaviour), and values (general concepts of good, bad; right, wrong).

The classroom as a behaviour setting has many unique qualities that distinguish it clearly from other social groups. The members of its "society" live but part of their lives there in. Within its confines they neither seek nor get full and complete satisfaction of all their spiritual and temporal needs. They are constrained to be members either because as teachers they achieve a limited fulfillment, largely vocational or economic, or as pupils because forces more powerful than they decree it. Once within the boundaries of the classroom the "unnaturalness" of the social situation asserts itself more. For here, in unbalanced distribution, are to be found firstly a number of children often neatly confined within a limited age range, and secondly one adult, probably female, who asserts power far beyond the limits that reason might (democratically) lead one to expect. Here as well is to be found a system characterised by some confusion, which tries nobly to be "all things to all pupils," but which often only succeeds in stressing examinable results that are subsequently, and often naively, equated with education. In its personnel then, the manner in which they are constrained, the idealistic nature of educational objectives, and the procedures by which attempts are made to achieve these objectives, the classroom is manifestly different from other social groups.

The classroom can be classified readily enough as a social system: social in the sense that it involves interacting individuals, and systematic in the sense that it is organised. However, it is severely prescribed in its manifestation of both aspects. Within it organization is uniquely patterned and interaction is characteristically (and even more uniquely) circumscribed.

To the extent that classrooms as social-behavioural settings can be identified consistently, there must be something that gives them identity as classrooms. This identity is not vested solely in the material phenomena involved, nor solely in the personnel. Rather, it derives in large degree from the characteristic activities and the prevailing behaviours that repeatedly occur there. These behaviours are customarily identified as being either "teaching" or "learning" depending on whether one looks at the teacher or the pupils. Regretably there is no single word that adequately describes the observable nature of these two processes taken together. There is no word that conveys the collective nature of the enterprise in the way that, for instance, "worship" does in the ecclesiastic setting. The terms "educative" and "education" have some utility but they appear to be weighted with pedagogical prejudgments about the effects of the system. "Educating," though little better, has been selected here to encompass the manifested character of the behaviours of both teachers and pupils. Collective behaviour occurring in the classroom setting will be termed "educating." "Educating," thus, is an observable behavioural characteristic of the classroom; it defines the essential character of the classroom setting and may be assumed to be omnipresent.

Given the educating function of the classroom, then necessarily "communication" is also an essential element. In order that educating may proceed, communication among the personnel or between the personnel and the artifacts, must exist. Without communication (defined in its broadest terms), educating is impossible.

The communication process requires, in its turn, "interactions" among the personnel. There are admittedly, communication situations that do not involve interpresonal interaction (e.g., reading a book, viewing a film, etc.). However, sufficient evidence exists to support the contention that much interaction (admittedly mostly verbal) exists among the members of the classroom group (Withall and Lewis, 1963).

On the assumptions contained in the preceding paragraphs a conceptual theory of the nature of the classroom setting has been devised. Attention should now be directed towards Figure 1 where the theory has been represented as a paradigm or model.

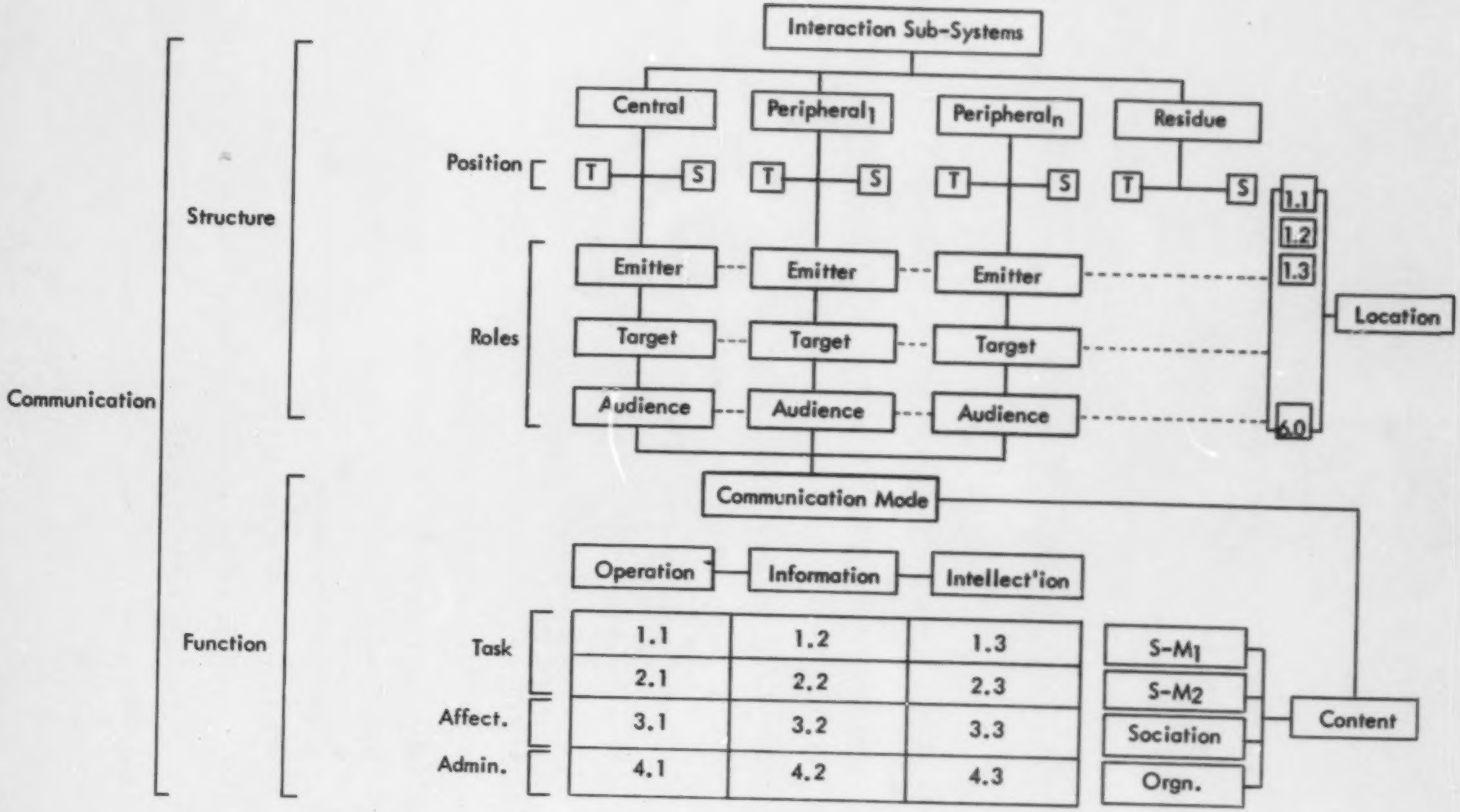
In the model the classroom is envisaged as a system of communication behaviours: that is, a boundary-maintaining set of inter-dependent sub-units of communication behaviours. These behaviours involve the personnel in interaction with each other. The behaviours have identifiable characteristics and occur sequentially in diverse ways.

As a first step in interpreting the behavioural character of classroom settings workable definitions of the basic concepts of communication and interaction should be undertaken.

Despite a considerable amount of social psychological research into concomitants of communication systems, the precise definition of "communication" per se has not been freely canvassed. Hare deals cursorily with the problem and defines a communication network as "who speaks to whom" (Hare, 1962). Most research takes the communication concept for granted and focuses intently on verbal communication alone. Stogdill warns against such practices:

> The emphasis on verbal communication tends at times to observe the fact that a member's gestures, facial expressions,

FIGURE 1
THE COMMUNICATION
SYSTEM OF THE CLASSROOM


Interaction Sub-Systems
Central
Peripheral$_1$
Peripheral$_n$
Residue
Communication
Structure
Position
T
S
Roles
Emitter
Target
Audience
1.1
1.2
1.3
6.0
Location
Communication Mode
Function
Operation
Information
Intellect'ion
Task
Affect.
Admin.
1.1
1.2
1.3
2.1
2.2
2.3
3.1
3.2
3.3
4.1
4.2
4.3
S-M$_1$
S-M$_2$
Sociation
Orgn.
Content

> postures and bodily tensions may communicate more to his fellow members than the words he utters (Stogdill, 1959).

Stogdill's point seems most reasonable, and an attempt has been made to accommodate it in this study. Communication is defined as the dissemination of symbolic meaning. The empirical implications of the definition are dealt with later. Suffice it is to say at this juncture that communication includes verbal (written and spoken) communications and communications by signs and signals. As such it is in harmony with the approach adopted towards the definition of "interaction."

Interaction has been defined by others in various ways.

> Social interaction is ... a relation between persons such that the behaviour of either one is stimulus to the behaviour of the other (English and English, 1958).

> By interaction it is meant that they (two individuals) emit behaviour in each other's presence, they create products for each other or they communicate with each other. In every case (that) we would identity as an instance of interaction there is at least the possiblity that the actions of each person affect the other (Thibaut and Kelley, 1959).

> . . . every action is treated as an interaction ... . because it is conceived to fall between, to connect, or to relate a subject to some aspect of situation or object. Usually but not necessarily the observed interaction will involve at least two separate biological individuals in

> addition to the observer. We assume that because of the ability to manipulate symbols which is characteristic of socialized human beings, any given person may be an object to himself. That is, in his capacity as a thinker, evaluator or actor, he can think about himself, have emotional reactions, or evaluative judgments about himself, and act in one way toward another part of himself which is tending to act in a contrary way (Bales, 1956).

These quotations reveal some of the difficulties inherent in seeking an adequate definition of the concept. For instance the position taken by English and English would allow as an "interaction" a chance episode in the life space of one individual which was prompted by an act of another when neither knew of each other's existence, were not even in reasonable proximity to one another, or for that matter, did not even exist in the same century! Thibaut and Kelley, while making propinquity a necessary condition, also permit it as the only one. Thus two people at opposite ends of a picture theatre and quite unaware of each other's presence are assumed to be interacting. Bales has given himself much more latitude than either of the other two, but as a result fails to make clear a distinction between action and interaction. While this has certain empirical usefulness, it nonetheless results in loss of precision.

For the purposes of this study interaction will be regarded as: a set of behaviours which brings about, or can be legitimately interpreted as attempting to bring about, communication between individuals. Communication here may be a verbal, physical, or by signs or signals. Thus the following kinds of situations are among those encompassed: conversations, discussions, arguments, fighting, shaking hands, letter writing, waving, and saluting. It is also regarded as an interaction when an attempt is being made by one person to communicate, unknown to another. Similarly an "accidental" comment, signal, or touch received by one person unknown to the initiator is also regarded as an interaction provided there is behavioural evidence registered by the recipient. The position taken here is justified mainly on the grounds that it delimits the term in a manner that is not inconsistent with common usage and that it is empirically viable.

The interpretations of both interaction and communication are based (as the definitions would demand) on an observational frame of reference. The focus in the main is placed upon readily observable behaviours that can be classified in terms of their manifested features.

Classroom Structure

In order to provide a measure of co-ordination in the model, one segment has been designated Structure. As the term is used here, structure means an order that is observed to persist among the communicating actors in the system. Theoretically the number of classroom members involved in any one communication exchange could range from two to the total number in the group. During certain kinds of exchanges however some members may not be involved in the communication network at all. At other times communication of any kind may be completely absent. These different contingencies have been accommodated in the model by the postulation of different communication sub-systems. These sub-systems are differentiated on the basis of the extent to which they command the attention of class members. The sub-systems where communication exists have been designated respectively the Central Sub-system and Peripheral Sub-systems 1 ...n. Any member who is not involved actively in any of these sub-systems is accommodated in the "Residue." The sub-systems and the residue when taken together as a pattern, or taken alone, can be shown to persist over time and to evince considerable change and variation. The nature of the sub-systems, the pattern they make collectively, and changes and variation that they manifest constitute a major focus of classroom structure.

Communication patterns occur over time and involve individuals who are in the classroom setting. Each of these individuals at any one time must occupy a particular location; a point in classroom space. Structure then may also be judged in terms of a geographical distribution of the personnel. It is likely that the distributions will also show evidence of change and variation.

The personnel involved in the classroom have been identified in two additional, structural ways; first according to the positions they hold, and second according to the roles they play. Each will be dealt with in turn.

Two social positions have been specified for the classroom, those of teacher and student (T and S in Figure 1). It is reasonable to assume that this gross positional breakdown describes all contemporary classrooms [see Chapter II by Wilson] while persons representing other positions are not often present in classrooms. Although both students and teachers may be attributed other positional affiliations (through training, relationships with others in the school, or personality, etc) for purposes of this paper such additional distinctions will be ignored.

Role will be taken to refer solely to acts involved in communicating. (This usage is more restricted than the original role concept put forward by Linton, 1936.) Three different communicating roles are specified in Figure 1. They have been designated (1) Emitter, (2) Target, and (3) Audience. The Emitter is the person communicating at the inception of the sub-system. The Target is the person or group to whom the communication is directed. The Audience consists of those members who are attending to the communication. A one role system comprises an audience only (class watching a film). A two role system consists of either an emitter and an audience (teacher lectures students) or an emitter and a target (student comments to student). A three role system involves an emitter, a target, and an audience (teacher disciplines single pupil while class watch). Any Central or Peripheral Sub-system during its existence must manifest at least one of the roles; it may on the other hand manifest either two or three roles.

Role and position, as they have been conceptualized here, are complementary. Any role can be identified according to whether incumbents of the teacher or student position occupy it. Members of any position can be identified according to the communicating roles they play.

Structure with its temporal and spatial components may perhaps be envisaged as the web on which the tapestry of the education picture is to be woven. It limits the extent of the picture, dictates the degree of fineness of work, and provides the foundational framework that will determine the durability of the finished product. Nonetheless the appeal and beauty of the work will owe little to it. Rather elegance will be derived from the woven pattern, the blending of forms, the balance of colour, the overall design. The sources of potential elegance in the classroom are to be found in the actual educating process itself. The process is delineated in Figure 1 by the heading, Function.

Classroom Function

At the risk of simplifying a complex process, function in the communication system has been taken to mean what goes on within the system, or more specifically, what characteristic forms of behaviour are manifested in the system. In the case of the classroom, the delineation of functional properties rests on the propositions that communication has "content" (is concerned with some topic or other) and that communication occurs in a characteristic manner or mode. In explaining these propositions, reference must be made to the basic assumptions that inform this paper. The "educating" concept provides the rationale for the ways in which both content and mode are to be interpreted.

To illustrate, a hypothetical classroom situation needs to be envisaged. Pedagogy tells us that in it we shall see a teacher teaching. Psychology tells us that in it we shall see children learning. Some of the things learned will be those the teacher believes he is teaching.

Some will not. When, however, pedagogical and psychological pre-judgments are put aside for a minute, if unsophisticated eyes are used then the scene appears differently. To that grossly overworked and accommodating man from Mars, the reality of the classroom might well be of quite a different kind. In the interests of the illustration let our man from Mars have grown up in a society to all intents and purposes like our own but lacking in one particular ingredient, schools. Due to means unvouchsafed to us as mortals, he and his kind come intuitively to the knowledges and experiences we strive to gain through our school system. Consequently teaching is unknown to him, and learning as a process carries no meaning either. What does he see in a classroom? First he sees people occupied variously. Some sit, some stand, some move about, some talk, some keep silent, some write, draw, point, prod, sing, fidget, cry, laugh, sleep, whisper. Among these people one appears to dominate. This one exerts a controlling influence, gives directions that are often carried out and makes condemnatory and approving comments. Others may do this too, but one seems to do it most.

There is much communication in this classroom. Some of it is surreptitious, the greater part of it public. It takes the form of talking primarily, although writing features quite often. It is possible that a peculiar mannerism of the inhabitants, the raising of one arm and agitating it fiercely in the air, is also a means of communication. It may be too that messages are conveyed in other ways in the setting. The individual who dominates the situation may, for instance, frown, pause, crash a leather strap on a desk or upon a reluctant hand whereupon the other members become silent. Communication in its many forms appears to be of considerable importance.

Not all of the communication is devoted to exchanges such as the last one illustrated however. There are many occasions during which information in one form or another is placed before the members. On such occasions the main preoccupation appears to be with the accuracy of detail which relates to this information. As well there are occasions when the members (or some of them) show a measure of mutual (communicatory) concern over intellectual processes. The latter appear to be characterized by focussing on reasons rather than facts, systems of logic rather than events. It seems, too, that ever so often these humans engage together in individual activities which involve no apparent communication and which presumably give the members opportunity to repeat (practice) earlier experiences.

Perhaps with our Martian's indulgence, he may be pressed to observe a number of classrooms seeing these behaviours again but in various forms and combinations. Perhaps he will come to discern within this variety, certain characteristic kinds of behaviour that he can use to illustrate differences between the classrooms. Perhaps too as he becomes more experienced he may be able to predict that where he sees certain characteristic behaviours (say emphasis on multi-group communication) certain other behaviours are also likely to occur (say a greater zest for learning). Perhaps in so doing he may, with excusable nonconformity, view each classroom more systematically and more comprehensively than his earthbound colleagues.

Communication Content

It is assumed that the content of classroom communication is concerned with three principle kinds of meanings. These are designated in the model as: Subject-matter, Sociation and Organization. Subject-matter meanings are concerned with "task" elements which are derived mainly, but not exclusively from syllabus and curriculum prescriptions. Sociation meanings relate to inter-personal exchanges concerned with affective, social-emotional behaviours. Organization meanings are identified in those communications which are directed towards the maintaining and perpetuating of the classroom as a functioning system. They are essentially administrative in character.

Subject-matter. Two kinds of subject matters are featured in the model. Subject-matter 1 refers to contents of communications that can be legitimately interpreted as directly relating to the kind of lesson specified at the time. For example, in an "arithmetic lesson" subject-matter 1 content means the content of communication that refers directly to arithmetic. However, many communications in classrooms do not bear on the subject ostensibly being taught. Thus even an arithmetic lesson can be punctuated by excursions into social studies, biology, literature and so on. Such digressions are classified under the heading, subject-matter 2, which subsumes all meanings that are related neither to the subject-matter specified for the class nor to maintenance of the class and its members.

Sociation. In this study, "sociation" is used to denote communication contents that either focus deliberately on the process of being sociable (negative or positive) or that clearly represent rocnized social conventions. "Good morning class," "how do you do," and "did you have a pleasant holiday" are communications of the latter kind. Exhortations to "be good citizens," "be tidy workers," "stop fighting," and "consider the importance of good manners" are all appropriate examples of the former; as are ameliorations of wounded limbs and feelings.

Organization. Whenever the content of any communication is devoted to matters that directly involve the administration of the classroom, the appropriate content category is "Organization." Under this heading fall communications that are concerned with controlling and directing all or any of the personnel or artifacts in the setting. It thus covers the numerous teacher directives that facilitate (sic) the functioning of the classroom. It also covers any communications concerned with similar matters but which emenate from the students. The effectiveness of such communications is not under review at this stage.

Communication Mode

The Mode concept is less easy to illustrate in that it represents a relatively novel way of interpreting the implications of the content of communications.

Information dissemination. Information Dissemination refers to all communication devoted to the conveying of information. Statements concerned with providing facts or clarifying facts; commenting; questioning; or asserting; illustrating; or demonstrating (or purporting to demonstrate) substantiated evidence, are regarded as falling under this heading. A brief reflection on the nature of examination scripts and upon the average textbook may provide more than an adequate testimony to the fact that acquisition of information is of prime importance to the system. Factual information features prominently in the educating intercourse. Facts are presented, interpreted, explained, elaborated, illustrated, and repeated with monotonous inevitability. In them is to be found the essence of "information dissemination."

Intellectualization. Intellectualization refers to all communications devoted expressly to the procedures involved in considering, reasoning, and indulging in deductive and inductive thought. It also includes, in addition, those non-logical procedures such as attitude expression, opinion giving, judgment making, interpretation making, assessing, and evaluating. It should be noted that in intellectualization the focus is on the overt procedure itself. As such intellectualization is quite distinct from the "intellectualizing" that is usually (sometimes optimistically) inferred as lying behind communications made by individuals.

One of the conceits that many teachers at all levels permit themselves is that they teach their students "to think." Furthermore, whether it is due to their agency or not, it is abundantly clear that children do learn how to think, at least in some fashion. It is contended here that a proportion of the communications occurring in classrooms focus on the actual procedure by means of which the members become familiar with the processes of thinking, reasoning, forming opinions, and so on.

Smith and Meux have undertaken pioneering work in this area (Smith and Meux, 1963). Their study of the logic of classroom discourse not only breaks new and fascinating ground, it also illustrates in part the potential complexity of the problem. Some of their categories for classifying "opening phases of episodes" can be readily accommodated within the model being presented in this paper. Thus, "Describing" and "Reporting" are classifiable as Information Dissemination. "Evaluating," "Opining," and "Conditional Inferring" are classifiable as Intellectualization behaviours. "Defining,","Designating," "Stating," "Substituting," "Classifying," "Comparison and Contrasting," and "Explaining" can be fitted into either one category or the other depending on contextual factors. Smith and Meux's last category "Directing, Managing" fits the Organization category. This illustration hints at the prospective reward for further investigation in this area.

The second kind os interpretation given to the Intellectualization category in this paper is less likely to hold immediate appeal for the semantically orientated reader. It has been decided to include in this category as well those untidy, illogical, and frequently unsystematic but nonetheless intellectual communication behaviours which give evidence of opinions, prejudices, judgments, interpretations, and the like, irrespective of the quality of the opinion, judgment, or evaluation itself. Again, what distinguishes this component of Intellectualization from Information Dissemination is it emphasis on the nature of the intellectual procedure rather than the "facts" that might contribute to the procedure.

Operation. The third sub-category, designated Operation in Figure 1, refers to those educating behaviours which cannot be classified under the other two headings and which appear to exist merely for the sake of the experience engendered. Thus, group singing may find an appropriate classification under this heading. Any student practice activities (reciting arithmetic tables, practicing a motor skill, doing writing drills, etc.,) are also included. So too are creative activities such as painting (without technical instruction) and dancing. Group quizzes, tests, and examinations are also located under this heading. Such activities are often ritualized in classrooms. They persist over time often with little variation. They carry their own momentum in that once they are started and their rules become established, they clearly circumscribe and prescribe behaviour. At such times, group behaviour is more overtly homogeneous than at most others. These are the occasions when uniformity reigns and conformity is the norm.

There are two incompletely resolved issues that need attention at this stage. They both revolve round the question of the relationship between the content and mode elements described. The first of these concerns the extent to which the categories can be regarded as mutually exclusive. The second is whether or not they collectively exhaust the universe of classroom behaviours. Each of these points will be taken in turn.

The mode categories have been so constructed that each is independent of the others. By definition any communication can be identified as either an Information Dissemination, Intellectualization, or Operation practice.

The differentiation of the three Content categories, Subject-matter,, Sociation and Organization, does not pose quite the same problem. Admittedly if Sociation is regarded as equivalent to psychology's "affect" then difficulties arise in that tone of voice, smiles, and the like can be taken as cues. However, when attention is focussed on the subject of discourse and not on individual acts such difficulties are diminished. It is possible, consequently, to classify all communication exchanges in terms of the four broad Content classifications postulated.

The approach used in this study to identify content and mode properties of classroom settings is more molar in character than most other analysis systems. As such it has something in common with Barker and Wright's (1954) approach to behaviour episodes. Their episode is a logically defined and discrete part of a stream of behaviour. The episode may be a single act but is more likely to be a complementary series of acts organized round a particular purpose. In a similar way the analysis of functional properties of classroom setting being used here sees communication not in terms of a number of discrete molecular communication acts alternating between individuals but in terms of the unity which underlies the exchange. This unity has been conceptualized in terms of the overt contents and modes of communication.

To return to the question of the exclusiveness of the functional elements in the model; the content categories are mutually exclusive. The mode categories are also mutually exclusive. However, mode and content are not independent of each other. Any communication in a given mode must also have a given content. Any communication with a given content must also be in a given mode. Consequently there are twelve distinguishable function forms that are to be derived from cross relating the three mode elements with the four content ones. These are illustrated in the functional matrix in the model.

It is contended then that the two major Functional categories employed in the study, Content and Mode, can be empirically identified and that whatever communication occurs within the classroom can be classified under one of their headings. It should be apparent that the categories are basically very broad and that many things have been rather roughly bundled into each of the twelve baskets. Subsequent analysis of the nature of, and variety of, their many ingredients would undoubtedly be rewarding. However, at this stage, ad hoc conjecturing about the complex nature of each category is not within the scope of the current presentation.

A final point needs to be made about this particular interpretation of function. In it some of education's most cherished concepts are deliberately ignored. Thus "aims" and "goals" are given no prominence, pedagogical "methodology" is omitted, and "learning" is treated with unaccustomed disregard. Such concepts are not being denied, rather are they being allocated a secondary role in the behavioural analysis of classroom interaction. Their relevance will be considered more fully on a later occasion.

An Empirical Study of Classroom Settings

The remaining pages of this paper are largely concerned with conjecturing about the existential nature of communication systems in classroom settings. Such conjecture however, has been circumscribed by the empirical study which has been initiated in order to validate the model. A brief account of this field study is therefore necessary. (A complete account of this study and its findings will be th subject of a future report.)

To carry out the empirical study, a number of television tape recordings have been taken of actual classroom settings while normal lessons were proceeding. All the behaviour that occurred during the lessons has been recorded and stored on tape. The recorded observations have then been subjected to intensive step by step analysis so that (1) the communication behaviours could be isolated and measured, and (2) their individual and collective character could be described.

The Sample

Approximately fifty classrooms were used in the study, and certain independent variables were employed so that a measure of discrimination among classroom settings might be possible. The independent variables chosen were: (1) Grade of class taught, (2) Sex of teacher, (3) Age of teacher, and (4) Subject-matter of the lesson. The sample was designed so that half of the sample settings had male teachers, and half had female teachers; half had teachers who were over forty, and half had teachers who were under thirty; a third of the classes were Grade I classes, a third were Grade VI classes, and a third were Grade XI classes; half of all the lessons observed were social studies lessons, and half were arithmetic or mathematics lessons. In general, each classroom or teacher was observed for two periods of approximately 50 minutes.

Analysis Procedure

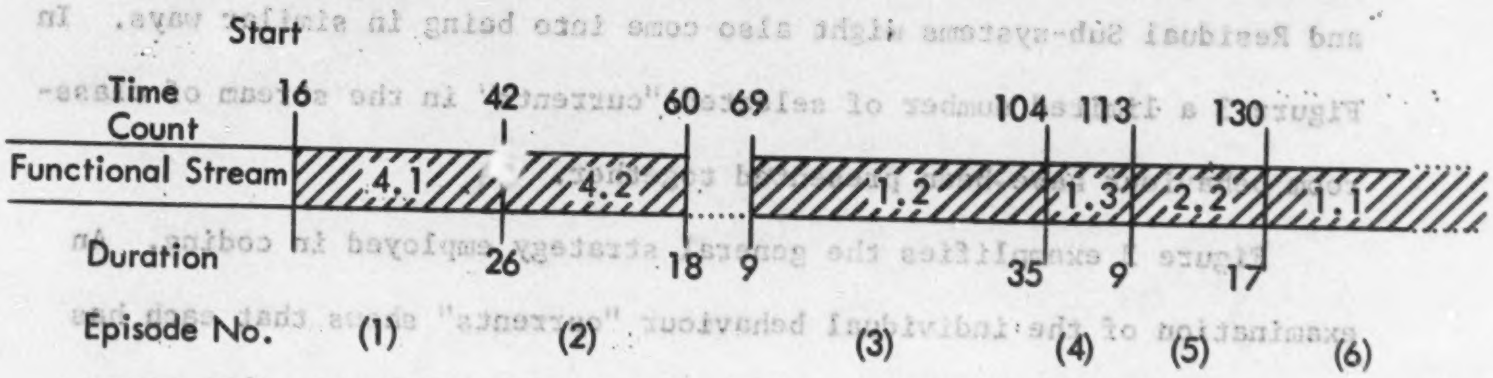
It is possible to envisage the behaviour manifested in classrooms very much as a flowing river or stream. Although the stream moves on steadily and continuously, there are eddies, ripples, and currents which, in disturbing the surface, establish some identity of their own although never with complete independence from the main current. It would be possible to see this river as a single unity, to trace its course, measure its volume, assess its speed, and so on. It would also be possible to investigate ripple patterns, identify eddies, estimate currents and in the process assess their relationship with the main body of water.

In a similar way it is possible to isolate the separate currents in the main stream of classroom behaviour. Each of the currents would have its own distinctive character. When taken collectively the currents would convey some impression of the larger river itself. In Figure 2 below function manifested in one sub-system has been envisaged as one such current.

In Figure 2 function is portrayed by the shaded strip. The different kinds of function are numbered to correspond with the functional categories of the matrix in the model. Thus, 4.1 stands for Organization-Operation behaviour, 4.2 for Organization-Information Dissemination behaviour, 1.2 for Subject-matter-Information Dissemination behaviour, etc. The first episode lasted 26 seconds. The second lasted 27 seconds. At the completion of episode No. 5 a total of 114 seconds had elapsed. This record, if finished, would provide a complete, continuous break-down

FIGURE 2

FIGURATIVE REPRESENTATION OF THE CODING OF FUNCTIONAL BEHAVIOUR


Start
Time Count
16
42
60
69
104
113
130
Functional Stream
4,1
4,2
1,2
1,3
2,2
1,1
Duration
26
18
9
35
9
17
Episode No.
(1)
(2)
(3)
(4)
(5)
(6)

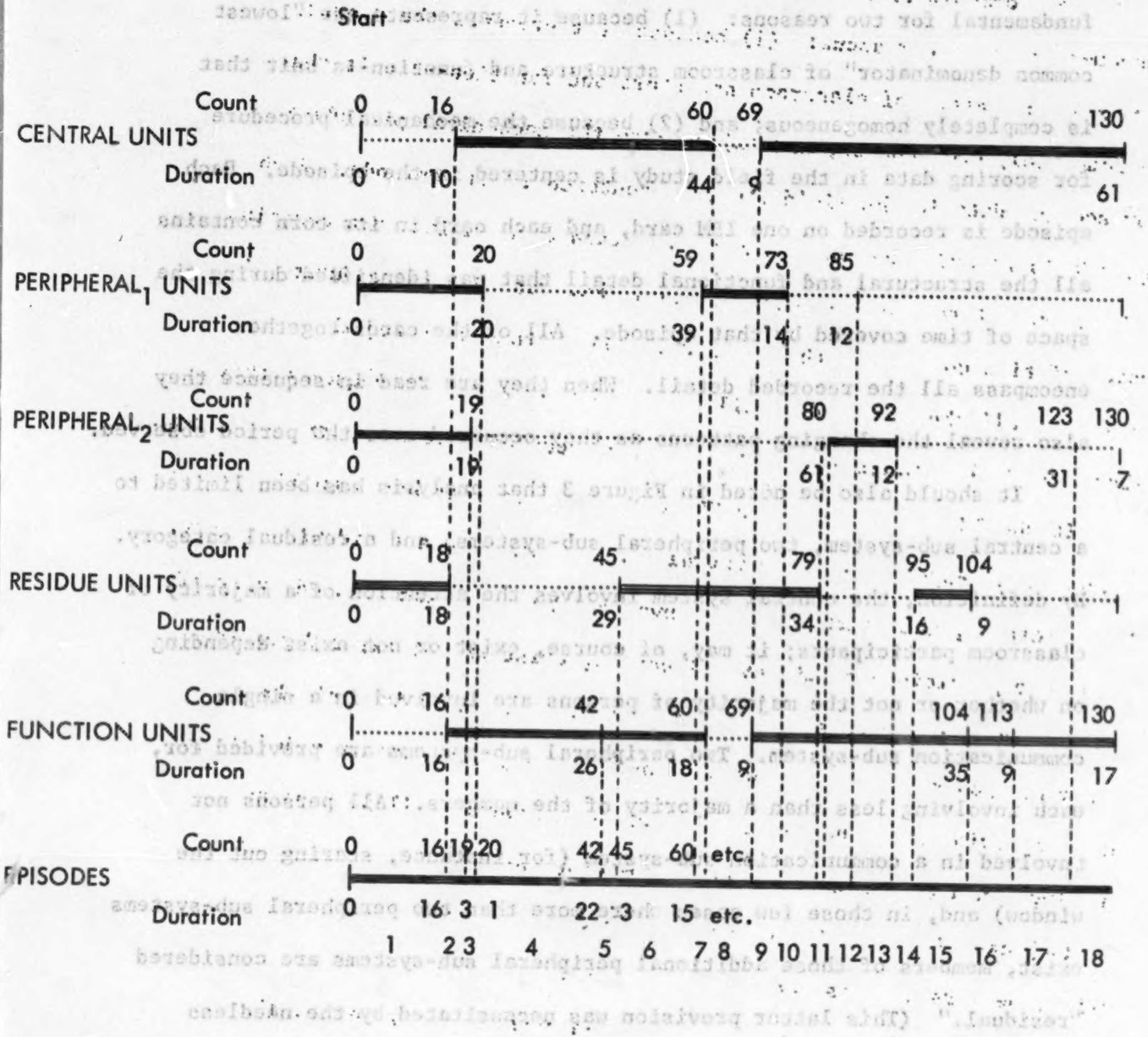
of the different kinds of function that occurred during the existence of the sub-system under analysis. From it would be derived information about the total time spent on each given function, the frequency of each one's occurrence, the variety and distribution of all functions, and patterns of recurring sequences.

However, at the same time as function proceeds, a number of structural characteristics might be manifested. For instance a Central Sub-system might emerge several times and persist for varying periods. Peripheral and Residual Sub-systems might also come into being in similar ways. In Figure 3 a limited number of selected "currents" in the stream of classroom behaviour have been presented together.

Figure 3 exemplifies the general strategy employed in coding. An examination of the individual behaviour "currents" shows that each has its own distinctive character which it owes to the changes that occur in it at different intervals. In the same way, some idea of the uniqueness of the total situation can be gained from a study of all the changes collectively. At the bottom of the figure there is a further stream designated "Episodes." Its pattern is established by the dotted lines which descend from each of the changes already indicated in the other individual streams. The Episode line records the unit count, and the duration of, any sort of change in any of the behaviour currents. For instance, the first dotted line occurs at Unit Count 16 because the Central sub-system changed at that point. The second occurs at 19 because Peripheral sub-system 2 changed at that point etc. The space between the dotted line shows unit of coding. This unit has been designated the

FIGURE 3

FIGURATIVE REPRESENTATION OF THE CODING OF SELECTED FUNCTIONAL AND STRUCTURAL ASPECTS OF CLASSROOM BEHAVIOUR


Start
CENTRAL UNITS
Count 0 16 60 69 130
Duration 0 10 44 9 61
PERIPHERAL1 UNITS
Count 0 20 59 73 85
Duration 0 20 39 14 12 1
PERIPHERAL2 UNITS
Count 0 19 80 92 123 130
Duration 0 19 61 12 31 7
RESIDUE UNITS
Count 0 18 45 79 95 104
Duration 0 18 29 34 16 9 1
FUNCTION UNITS
Count 0 16 42 60 69 104 113 130
Duration 0 16 26 18 9 35 9 17
EPISODES
Count 0 16 19 20 42 45 60 etc.
Duration 0 16 3 1 22 3 15 etc.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

communication episode and is defined as "a unit of time during which the pattern of communication within the setting remains constant." It is fundamental for two reasons: (1) because it represents the "lowest common denominator" of classroom structure and function--a unit that is completely homogeneous; and (2) because the mechanical procedure for scoring data in the field study is centered in the episode. Each episode is recorded on one IBM card, and each card in its turn contains all the structural and functional detail that was identified during the space of time covered by that episode. All of the cards together encompass all the recorded detail. When they are read in sequence they also reveal the changing patterns as they occurred over the period observed.

It should also be noted in Figure 3 that analysis has been limited to a central sub-system, two peripheral sub-systems, and a residual category. By definition, the central system involves the attention of a majority of classroom participants; it may, of course, exist or not exist depending on whether or not the majority of persons are involved in a single communication sub-system. Two peripheral sub-systems are provided for, each involving less than a majority of the members. All persons not involved in a communication sub-system (for instance, staring out the window) and, in those few cases where more than two peripheral sub-systems exist, members of those additional peripheral sub-systems are considered "residual." (This latter provision was necessitated by the needless complexity involved in providing for any number of peripheral sub-systems.) Sub-systems are subject to further analysis for role structure, functional analysis, and the like; residual persons are not so analyzed.

A great deal of information is symbolized in Figure 3. From one single IBM card it is possible to gain information about three sub-systems, positional affiliation for up to three roles for each sub-system, the location of all actors, and the functions manifested in each. Some means must be found for the concise expression of such complex materials; and in order that meaningful hypotheses may be stated and tested, seven variable classes have been formed to express the potential variability of classroom episodes. These are communication-system structure, functional character, role structure, role allocation, position assignment, role location, and position location. Each variable class is defined and discussed below.

Communication-system Structure. Communication-system structure as a variable class comprises the unique configuration of communication sub-systems existing in a classroom setting over a given period of time. At any given moment only one set of systems is admissable. Altogether, there are sixteen possible alternative structures, although one of them is vacuous provided the classroom has people in it.

(o) No Systems -- (vacuous)
(i) Central system (only)
(ii) Peripheral$_1$ sub-system (only)
(iii) Peripheral$_2$ sub-system (only)
(iv) Residual persons (only)
(v) Central system plus peripheral$_1$ sub-system
(vi) Central system plus peripheral$_2$ sub-system
(vii) Central system plus residual persons

(viii) Peripheral$_1$ plus peripheral$_2$ sub-systems

(ix) Peripheral$_1$ sub-system plus residual persons

(x) Peripheral$_2$ sub-system plus residual persons

(xi) Central system plus peripheral$_1$ and peripheral$_2$ sub-systems

(xii) Central system plus peripheral$_1$ sub-system and residual persons

(xiii) Central system plus peripheral$_2$ sub-system and residual persons

(xiv) Peripheral$_1$ plus peripheral$_2$ sub-systems and residual persons

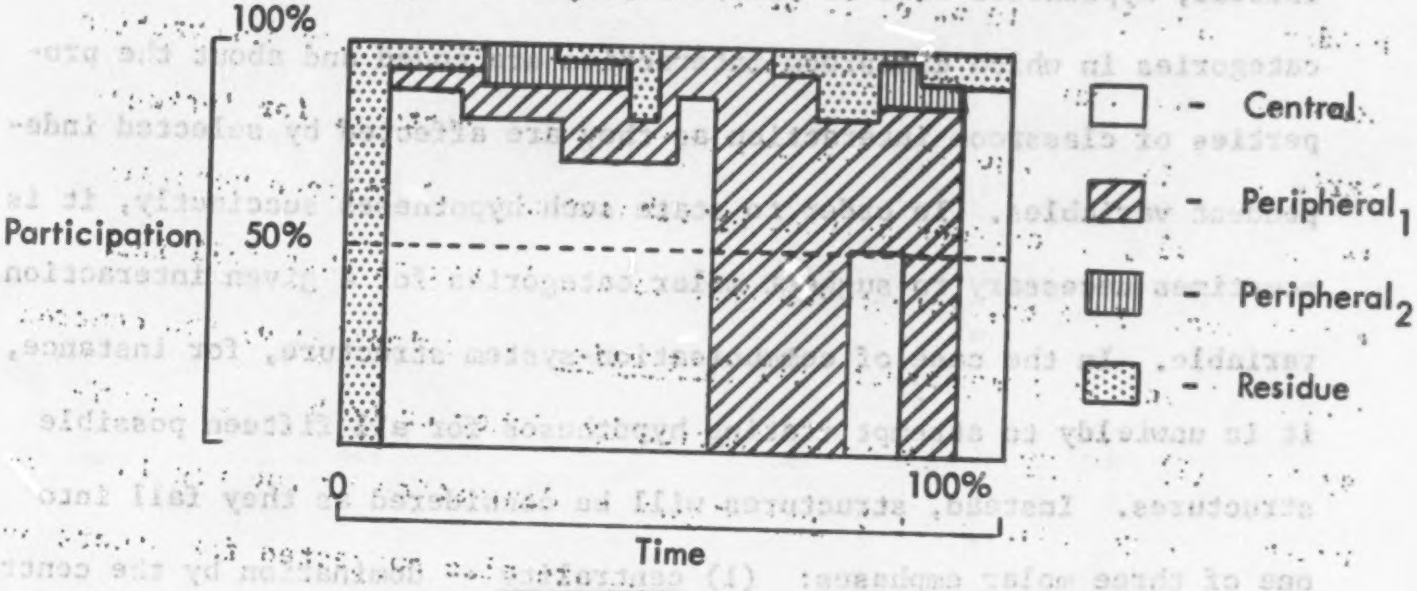
(xv) Central system plus peripheral$_1$ and peripheral$_2$ sub-systems and residual persons

Over a period of classroom time it is anticipated that communication sub-systems will emerge, be sustained, disappear, re-appear, be re-constituted and changed. In Figure 4 the Communication System Structure of a hypothetical setting and lesson has been presented. It shows both the extent to which the different communication sub-systems endured and the extent to which they attracted the participation of class members.

Given the distribution of communication-system structure over a classroom lesson, as is illustrated in Figure 4, questions of two types are likely to occur to the investigator. Some of these are sequential in nature; e.g., what precipitates the emergence of transitory or permanent peripheral groups? Other questions focus on the distribution of communication-system structures from setting to setting; for instance, under what conditions are central systems maximized or minimized; or, what are the likely effects of the predominance of peripheral sub-systems in classroom settings?

For purposes of stating hypotheses in this paper questions of only the latter kind will be considered. It is proposed to ignore here problems stemming from the sequential nature of classroom interaction. Instead, hypotheses will be stated about the coincidence of various categories in which [illegible] and about the properties of classroom [illegible] are affected by selected independent variables. [illegible] such hypotheses succinctly, it is sometimes necessary [illegible] molar categories for a given interaction variable. In the case of [illegible] system structure, for instance, it is unwieldy to attempt [illegible] hypotheses for all fifteen possible structures. Instead, structures will be considered as they fall into one of three molar emphases: (1) centrality -- domination by the central system, (2) peripherality -- domination by either or both of the peripheral sub-systems, and (3) residuality -- domination by the non-involvement of persons. Similar molar emphases are also suggested for others of the interaction variables below.

FIGURE 4
COMMUNICATION SYSTEM STRUCTURE



Functional Character. Functional character comprises the unique configuration of functional properties for a specified communication sub-system over a given period of time. By definition then, functional character may be judged separately for central and peripheral sub-systems and may characterize either a fraction or the entire lesson hour.

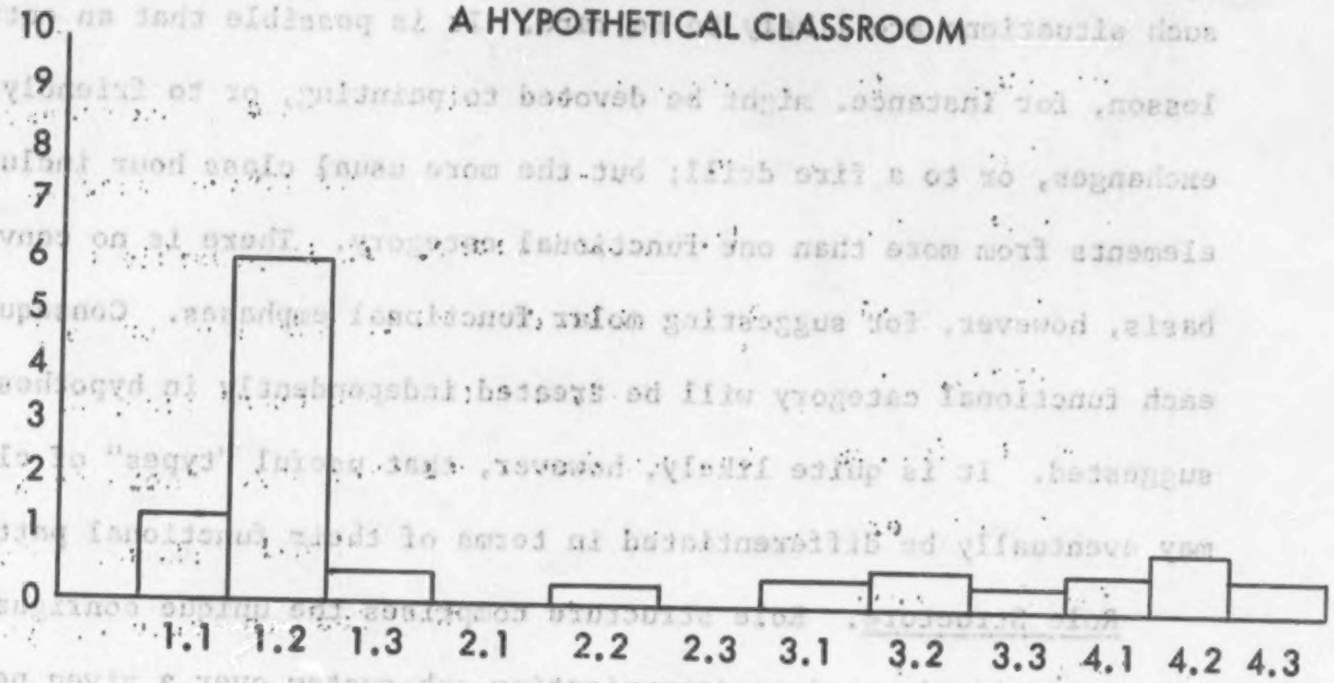
Analysis of the occurrence of different functional variables is also expected to yield a patterned distribution. For illustrative purposes, the distribution of functional variables for the central system in a hypothetical classroom has been presented graphically in Figure 5.

For purposes of stating hypotheses in this paper questions of only the latter kind will be considered. It is proposed to ignore here problems stemming from the sequential nature of classroom interaction. Instead, hypotheses will be stated about the coincidence of various categories in which classroom interaction are coded and about the properties of classroom interaction as they are affected by selected independent variables. In order to state such hypotheses succinctly, it is sometimes necessary to suggest molar categories for a given interaction variable. In the case of communication-system structure, for instance, it is unwieldy to attempt stating hypotheses for all fifteen possible structures. Instead, structures will be considered as they fall into one of three molar emphases: (1) centrality -- domination by the central system, (2) peripherality -- domination by either or both of the peripheral sub-systems, and (3) residuality -- domination by the non-involvement of persons. Similar molar emphases are also suggested for others of the interaction variables below.

Functional Character. Functional character comprises the unique configuration of functional properties for a specified communication subsystem over a given period of time. By definition then, functional character may be judged separately for central and peripheral sub-systems and may characterize either a fraction of or the entire lesson hour.

Analysis of the occurrence of different functional variables is also expected to yield a patterned distribution. For illustrative purposes, the distribution of functional variables for the central system in a hypothetical classroom has been presented graphically in Figure 5.

FIGURE 5
FUNCTIONAL CHARACTER OF
A HYPOTHETICAL CLASSROOM



Although it is theoretically possible that in a given classroom all communication would occur within one of the twelve functional categories, such situations are likely to be rare. It is possible that an entire lesson, for instance, might be devoted to painting, or to friendly exchanges, or to a fire drill; but the more usual class hour includes elements from more than one functional category. There is no convenient basis, however, for suggesting molar functional emphases. Consequently, each functional category will be treated independently in hypotheses suggested. It is quite likely, however, that useful "types" of classrooms may eventually be differentiated in terms of their functional patterns.

Role Structure. Role structure comprises the unique configuration of roles existing in a given communication sub-system over a given period of time. For any given sub-system at a given time only a single role system is admissable. Four role systems are possible, however:

(i)	Audience only	(A)
(ii)	Emitter and Target	(E + T)
(iii)	Emitter and Audience	(E + A)
(iv)	Emitter, Target, and Audience	(E + T + A)

By definition, role structure may be judged either for the central or for a peripheral sub-system and may characterize either a fraction of or the entire lesson hour. Since there are but four role structure categories, no attempt will be made to provide more molar emphases into which role structures are classifiable. Again, it is likely that particular types of classrooms will show unique patterns of role structure.

Role Allocation. Role allocation comprises the unique configuration of system members assigned to the roles of a communication sub-system over a given period of time. In general, eight basic categories will be used for assigning individuals to roles. These are:

(i) No one

(ii) The teacher

(iii) A single pupil

(iv) A pupil segment (two or more pupils, but not a quorum)

(v) A pupil quorum (more than 50% of pupils)

(vi) A single pupil plus the teacher

(vii) A pupil segment plus the teacher

(viii) A pupil quorum plus the teacher

Any given role allocation, thus, will be defined by the unique assignment of individuals, identified in terms of the above categories, to the three roles, E, T, and A. Theoretically, there are some 512 different role allocations that may be made, although many of these are precluded by definitional rules. For instance, the code "No one" must be assigned to a non-existent role. Again, if the teacher is assigned to any one role, she may not be assigned simultaneously to any other, and so forth. Nonetheless a large number of meaningful types of role allocation remain. For instance, when Emitter and Audience alone are considered there are at least twenty role allocation possibilities. Sub-systems exhibiting three roles, of course, exhibit even more possiblities. For convenience in stating hypotheses, three molar emphases are suggested for role allocation. Any given role may be shown to be characterized by : (1) Teacher or pupil, (2) Single pupil or pupil segment, (3) Pupil segment or pupil quorum. It should also be noted that role allocation, again, may apply to either the central or to peripheral sub-systems, although the category, "pupil quorum," appears only for central sub-system codes.

Position Assignment. Position assignment comprises the unique roles assigned to system members over a given period of time. (In role allocation one is concerned with the shifting membership of role; in position assignment one is concerned with the shifting roles of persons.) Since in this study persons are only identified by position membership, and since only one person is identified uniquely -- the teacher -- coding of position assignment is confined to the teacher position alone. Ten categories will be used to express position assignment of the teacher.

(i) Teacher residual or out of the room
(ii) Teacher emitter of the central system
(iii) Teacher target of the central system
(iv) Teacher audience of the central sub-system
(v) Teacher emitter of peripheral_1 sub-system
(vi) Teacher target of peripheral_1 sub-system
(vii) Teacher audience of peripheral_1 sub-system
(viii) Teacher emitter of peripheral_2 sub-system
(ix) Teacher target of peripheral_2 sub-system
(x) Teacher audience of peripheral_2 sub-system

It should be noted that the above categories are codable once only for any given instant during the lesson. Since there are but few categories involved, no molar emphases are necessary.

Role Location. Role location comprises the unique configuration of locations of role encumbents over a given period of time. Since roles are filled by human beings, it is possible to establish their location with regard to one another by observing their physical position in a systematic fashion. This is difficult to do for classrooms since a number of arrangements of the desks, tables, and other physical objects in the classroom may be observed. For instance, "standard" classrooms usually involve a box-like arrangement of pupils with the teacher lecturing from the front. Other classrooms may find pupils arranged in a semi-circle or isolated circles of pupil's desks in several corners of the room. We have attempted to handle each of these configurations in a standardized fashion by providing a two-dimensional grid of locations within the classroom based on the concept of "frontness." The locational categories used provide both longitudinal and latitudinal information.

Longitudinal Locations	*Latitudinal Locations*
(1) Diffuse	(1) Diffuse
(2) Front	(2) Right side
(3) Forward	(3) Right
(4) Middle	(4) Middle
(5) Rear	(5) Left
(6) Back	(6) Left side

(In using these categories, "diffuse" means either that the group of persons identified stretches across a number of boundaries or that an individual oscillates across boundaries.) These categories enable one to pin-point the location of role actors. For instance, to place an actor at "24" means that he is standing at the middle of the front of the classroom. Again, the location "11" is usually applied to the classroom group as a whole.

It is possible, of course, to locate the roles of each sub-system, which means that possibly ten roles in all may be located. Since each role location involves one of 26 possible codes, the locations of even the roles of a single sub-system comprise a great many possibilities. In general, hypotheses will be stated for only one molar emphasis that applies to role location, the extent to which communication is diffused throughout the setting or confined to select individuals. Predictions will be given for various roles, however.

Position Location. Position location comprises the unique locations of system members over a given period of time. Since in this study persons are only identified by position membership, and since (again) only the teacher is identified uniquely, position location coding is confined to the teacher position alone. Teacher location will be given in terms of the same code categories as were used above for role location. Since thirty-six locations are possible for the teacher, a molar emphasis is suggested for purposes of stating hypotheses: teacher mobility.

Hypotheses

It is now possible to suggest a series of hypotheses based on assumptions about the relationships that may be expected among variables. Two types of hypotheses will be advanced: (1) hypotheses pertaining to relationships between functional and structural variables, and (2) hypotheses relating independent variables to classroom phenomena. Hypotheses of the former type are presumed to state conditions governing classroom interaction in *all* classrooms, while hypotheses of the latter type deal with differences among classrooms of specific sorts. In order to avoid repetitive statements, hypotheses have been summarized and presented in tabular form. Each hypothesis, if stated in full, would be couched in the following way:

The greater the incidence of variable x than the greater the incidence of variable y.

Several other devices have also been used to streamline presentation: (1) Each of the twelve functional categories is treated as a separate variable. (2) Structural variables are taken in the order set out below and are considered only on the basis of the categories specified there.

Structural Variables	Categorisation
a. Communication System Structure	Centrality or Peripherality or Residuality
b. Role structure	Diversity vs. Specificity (1,2 or 3)
c. Role allocation	Pupils (single, segment, quorum) vs. Teacher
d. Position assignment (Teacher)	Emitter (E), Target (T) or Audience (A)
e. Location assignment	Diffusion vs. Non-Diffusion (E,T & A)
f. Position location (Teacher)	Mobility vs. Non-Mobility

(3) Except where specifically mentioned, hypotheses are stated for the central communication system and ignore effects in the peripheral systems.

Functional and Structural Relationships

Table 1 presents hypotheses relating the coincidence of functional and structural properties of classroom interaction. Reflected in the presentation of these hypotheses is a tacit assumption that Function determines Structure (at least in the way they have both been conceived here). Such an assumption may be unwarranted. It may be that some Functional Modes, if not Contents, are determined by Strucrual factors. However, because this point of view cannot be readily reconciled with available evidence, it has not been accommodated here and will not be further discussed.

Each hypothesis of Table 1 is relatively modest, postulating as it does a relationship between only two variables immediately testable. The provision of a more ambitious multi-dimensional set of hypotheses relating a number of variables together simultaneously was considered inadvisable on the grounds that adequate supportive theory is not available at present. Even the hypotheses that are put forward here are based on what can only be claimed to be a reasonable interpretation of the single functional variable predicated. For example, Subject Matter - Operation in its simplest interpretation means "undertaking activities related to the subject matter of the lesson" and would include such behaviour as writing in books, reading alone, chanting lessons in unison, painting etc. Now because most "operation" functions are activities undertaken in characteristic (almost

TABLE I

HYPOTHESISED PROPORTIONAL RELATIONSHIPS BETWEEN FUNCTIONAL AND STRUCTURAL VARIABLES.

INCIDENCE	COINCIDENCE	
"The greater the..	"The greater the ..	No.
Subject-matter$_1$: Operation (1.1)	a. Peripherality	001
	b. Two role	002
	c. Emitter: quorum	003
	d. Teacher: Target	004
	e. Emitter: diffuse	005
	f. Mobility	006
Subject-matter$_1$: Information Dissemination (1.2)	a. Residuality	007
	b. Three role	008
	c. Audience: quorum	009
	d. Teacher: Emitter	010
	e. Audience: diffuse	011
	f. Non-mobility	012
Subject-matter$_1$: Intellectualisation (1.3)	a. Centrality	013
	b. Role diversity	014
	c. Target: Single pupil	015
	d. Teacher: Emitter	016
	e. Target: diffuse	017
	f. --	
Subject-matter$_2$: Operation (2.1)	a. Centrality	018
	b. Two role (E & T)	019
	c. Emitter: quorum	020
	d. Teacher: Target	021
	e. Emitter: diffuse	022
	f. --	

5

TABLE I con't

INCIDENCE	COINCIDENCE	
"The greater the ..	"The greater the ..	No.
Subject-matter$_2$: Information Dissemination (2.2)	a. Centrality	023
	b. Three role	024
	c. Audience: quorum	025
	d. Teacher: Emitter	026
	e. Audience: diffuse	027
	f. --	
Subject-matter$_2$: Intellectualisation (2.3)	a. Peripherality	028
	b. Two role (E & T)	029
	c. Target: Single pupil	030
	d. Teacher: Emitter	031
	e. Target: diffuse	032
	f. Mobility	033
Sociation: Operation (3.1)	a. Peripherality	034
	b. Two role (E & T)	035
	c. Emitter: Single pupil	036
	d. Teacher: Audience	037
	e. Emitter: diffuse	038
	Target: diffuse	038
	f. Mobility	039
Sociation: Information Dissemination (3.2)	a. Centrality	040
	b. Three role	041
	c. Target: Single pupil	042
	Audience: quorum	042
	d. Teacher: Emitter	043
	e. Target: Non-duffuse	044
	Audience: diffuse	044
	f. --	

TABLE I con't

INCIDENCE	COINCIDENCE	
"The greater the ..	"The greater the ..	No.
Sociation:	a. Residuality	045
Intellectualisation	b. Three role	046
(3.3)	c. Target: quorum	047
	d. Teacher: Emitter	048
	e. Audience: diffuse	049
	f. Non-mobility	050
Organisation:	a. Residuality	051
Operation	b. Two role (E & T)	052
(4.1)	c. Target: Single pupil	053
	d. Teacher: Target	054
	e. Target: diffuse	055
	f. Mobility	056
Organisation:	a. Residuality	057
Information	b. Three role	058
Dissemination	c. Target: segment	059
(4.2)	Audience: quorum	059
	d. Teacher: Emitter	060
	e. Audience: diffuse	061
	f. Non-mobility	062
Organisation:	a. Peripherality	063
Intellectualisation	b. Two role (E & T)	064
(4.3)	c. Target: Single pupil	065
	d. Teacher: Emitter	066
	e. Target: non-diffuse	067
	f. --	

ritualistic) ways in most classrooms it seems reasonable to predict that in such situations there will be an increase in the number of inter-student (informal) exchanges and therefore in the amount of Peripherality. It seems to follow too, that if students are without continuous direct teacher guidance they will have greater occasion to seek it, thus causing the teacher to become indentifiable as a Target. Similar rationalizations underlie the other hypotheses as well.

Independent Variable Effects

It will be recalled that four independent variables have been included in the empirical study presently underway: age and sex of teacher, and grade level and subject taught. The usefulness of the variables selected will ultimately depend on the extent to which they provide an effective basis for prediction. If, for instance, a significant relationship can be shown to exist between say, "teacher maleness" and "intellectualization," or between "social studies" and "sociation," or "age" and "centrality," there is scope for exercising some measure of control over classroom interaction. It is not appropriate here to debate how that control should be exercised; it is sufficient merely to recognise the prospect.

It should also be noted that the independent variables chosen are relatively phenotypic. Thus there is no reason per se why the "age" of the teacher should affect classroom interaction. On the contrary, "age" will affect the classroom only as "age" manifests itself in behaviour. Presumably a teacher who is (chronologically) young acts in a particular way, and it is this action that manifests itself in particular kinds of communication. This suggests that genotypic explanations of independent variable effects on the classroom depend on the identification of appropriate intervening variables.

In order to posit a genotypic interpretation of both the "age" and "sex" of the teacher, certain characteristics identified by Ryans (1960) have been used. Ryans' study led him to isolate three major patterns of teacher behaviour (clusters or families of teacher-behaviour dimensions). These are:

T.C.S. Pattern X ...	Warm, kindly, understanding, friendly versus Aloof, egocentric, restricted;
T.C.S. Pattern Y ...	Responsible, business-like, systematic versus Evading, unplanned, slipshop;
T.C.S. Pattern Z ...	Stimulating, imaginative versus Dull, routine, unimaginative.

These bi-polar patterns (factor analytically derived) are regarded by Ryans as independent of each other. However, it seems reasonable to theorize that each one of the patterns would be manifested to some degree in any given teacher. (See also the study by Solomon and Miller, 1961).

To use Ryans' framework as a basis for interpreting classroom interaction requires that one make assumptions about the relationship between these patterns and the "age" and "sex" of the teacher. Ryans' own conclusions, which are somewhat value laden, are that older teachers as a group are shown to be at a "disadvantage" when compared with younger teachers except from the standpoint of "... systematic and businesslike classroom behaviour." At the elementary school level Ryans found that men were less businesslike, more democratic, and more permissive than women. At the secondary level, women received higher ratings on friendliness, responsibility, and stimulating classroom behaviour. However, in view of the variety of tests Ryans used and his treatment of T.C.S. patterns as mutually exclusive, it is necessary to go beyond these findings. Consequently certain assumptions about the manifestation of behaviours related to teacher "age" and teacher "sex" have been made. It is assumed that settings involving women teachers are characteristically "warmer" than those involving men teachers; and that men teacher settings are characteristically more "stimulating" than women teacher settings. It is assumed that settings with older teachers are characteristically more "businesslike" than setting with younger ones; and that younger teacher settings are "warmer" than older teacher settings; and finally that younger teacher settings are more "stimulating" than older teacher settings.

The two other variables, grade of class and subject taught, can be treated in a similar manner. It is assumed that the grade level of a class can be taken as indicative of the social and educational maturity of the pupils. It is also assumed that different kinds of subject matter, because of the way tradition has interpreted their content, also invite predictable behaviour.

These assumptions may also be related to patterns of classroom interaction. For instance it seems reasonable to assume that the lower the grade level and the more immature, spontaneous and "natural" the pupils, the greater will be the amount of teacher warmth exhibited, the greater the concentration on efficiency procedure, the greater the manifestation of motivational techniques. On the assumption that arithmetic is a "hard" subject and that social studies is a "soft" subject it may be suggested that arithmetic invites cold, dull, but businesslike teaching behaviour. Correspondingly, social studies invites warm, stimulating, and unbusinesslike teaching behaviour. Specifying the expected relationship between independent and dependent variables now becomes firstly a matter of predicting the effects of warm, cold, businesslike, slipshod, stimulating and dull educating behaviour on communication structure and function: and secondly, of extrapolating back to the independent variables.

The procedure to be adopted for presenting hypotheses is similar to that adopted for the preceding set and is relatively straightforward. Around each single independent variable is constructed a set of hypotheses about the way in which classroom processes manifest themselves in the situations defined by the independent variables. Each independent variable presents differentiated categories. Prediction is undertaken by hypothesising the comparatively greater existence of selected structural or functional properties for the different categories. Hypotheses are given in Tables 2 through 5.

TABLE 2

HYPOTHESISED RELATIONSHIP OF STRUCTURAL AND FUNCTIONAL VARIABLES WITH SEX OF THE TEACHER AS THE INDEPENDENT VARIABLE.

Variable Class	"The greater the incidence"		
Functional Properties	Teacher Settings		No.
	Male	Female	
(1.1) Subject Matter$_1$: Operation	x		068
(1.2) Subject Matter$_1$: Information Dissemination			
(1.3) Subject Matter$_1$: Intellectualisation	x		069
(2.1) Subject Matter$_2$: Operation			
(2.2) Subject Matter$_2$: Information Dissemination		x	070
(2.3) Subject Matter$_2$: Intellectualisation			
(3.1) Sociation : Operation		x	071
(3.2) Sociation : Information Dissemination			
(3.3) Sociation : Intellectualisation	x		072
(4.1) Organisation : Operation		x	073
(4.2) Organisation : Information Dissemination		x	074
(4.3) Organisation : Intellectualisation			
Structural Properties			
a. Centrality	x		075
Residuality		x	075
b. Role Diversity		x	076
c. Target: single	x		077
: segment		x	078

TABLE 2 con't

	Emitter : Single		x	079
	Audience : quorum	x		080
d.	Teacher : Emitter	x		081
	: Target		x	082
e.	Emitter : diffuse		x	083
f.	Mobility		x	084

TABLE 3

HYPOTHESISED RELATIONSHIP OF STRUCTURAL AND FUNCTIONAL VARIABLES WITH AGE OF THE TEACHER AS THE INDEPENDENT VARIABLE

Variable Class	"The greater the incidence"		
Functional Properties	Teacher Settings		No.
	Older	Younger	
(1.1) Subject Matter$_1$: Operation		x	085
(1.2) Subject Matter$_1$: Information Dissemination	x		086
(1.3) Subject Matter$_1$: Intellectualisation		x	087
(2.1) Subject Matter$_2$: Operation			
(2.2) Subject Matter$_2$: Information Dissemination		x	088
(2.3) Subject Matter$_2$: Intellectualisation	x		089
(3.1) Sociation : Operation		x	090
(3.2) Sociation : Information Dissemination	x		091
(3.3) Sociation : Intellectualisation		x	092
(4.1) Organisation : Operation		x	093
(4.2) Organisation : Information Dissemination		x	094
(4.3) Organisation : Intellectualisation			
Structural Properties			
a. Centrality	x		095
Peripherality		x	096
Residuality		x	097
b. Role diversity		x	098
c. Emitters : individual		x	099

TABLE 3 con't

	: segment		x	100
	: quorum		x	101
	Audience : segment		x	102
	: quorum	x		103
d.	Teacher : Target		x	104
	: Emitter	x		105
	: Audience		x	106
e.	Emitter : diffuse		x	107
	Target : diffuse	x		108
f.	Mobility		x	109

TABLE 4

HYPOTHESISED RELATIONSHIP OF STRUCTURAL AND FUNCTIONAL VARIABLES WITH GRADE OF CLASS AS AN INDEPENDENT VARIABLE

Variable Class	"The greater the proportional incidence" (expressed as a rank order among grades).			No.
Functional Properties	Grade			
	I	VI	XI	
(1.1) Subject Matter$_1$: Operation	1	2	3	110
(1.2) Subject Matter$_1$: Information Dissemination	3	2	1	111
(1.3) Subject Matter$_1$: Intellectualisation	3	1	2	112
(2.1) Subject Matter$_2$: Operation	-	1	-	113
(2.2) Subject Matter$_2$: Information Dissemination	2	1	3	114
(2.3) Subject Matter$_2$: Intellectualisation	2	1	3	115
(3.1) Sociation : Operation	1	2	3	116
(3.2) Sociation : Information Dissemination	1	2	3	117
(3.3) Sociation : Intellectualisation	3	1	2	118
(4.1) Organisation : Operation	1	2	3	119
(4.2) Organisation : Information Dissemination	2	1	3	120
(4.3) Organisation: Intellectualisation	3	2	1	121
Structural Properties	I	VI	XI	
a. Centrality	3	2	1	121
Residuality	1	3	2	122
Peripherality	1	2	3	123

TABLE 4 con't

b.	Role Diversity	1	2	3	124
c.	Emitter : single	1	2	3	125
	Target : quorum	3	2	1	126
	Audience : quorum	3	2	1	127
d.	Teacher : Emitter	1	3	2	128
	: Target	2	1	3	129
	: Audience	2	1	3	130
e.	Emitter : non diffuse	3	2	1	131
f.	Mobility	1	2	3	132

TABLE 5

HYPOTHESISED PROPORTION RELATIONSHIP OF STRUCTURAL AND FUNCTIONAL VARIABLES WITH SUBJECT TAUGHT AS AN INDEPENDENT VARIABLE

Variable Class	"The greater the proportional incidence"		No.
Functional Properties	**Arithmetic**	**Social Studies**	
(1.1) Subject Matter$_1$: Operation	x		133
(1.2) Subject Matter$_1$: Information Dissemination	x		134
(1.3) Subject Matter$_1$: Intellectualisation		x	135
(2.1) Subject Matter$_2$: Operation		x	136
(2.2) Subject Matter$_2$: Information Dissemination	x		137
(2.3) Subject Matter$_2$: Intellectualisation		x	138
(3.1) Sociation : Operation		x	139
(3.2) Sociation : Information Dissemination		x	140
(3.3) Sociation : Intellectualisation		x	141
(4.1) Organisation : Operation		x	142
(4.2) Organisation : Information Dissemination		x	143
(4.3) Organisation : Intellectualisation		x	144
Structural Properties	**Arithmetic**	**Social Studies**	
a. Centrality	x		144
Residuality		x	145
Peripherality		x	146
b. Role diversity		x	147

TABLE 5 con't

c.	Emitter : single		x	148
	Target : single	x		149
	Audience : Quorum	x		150
d.	Teacher : Emitter	x		151
	: Target		x	152
	: Audience		x	153
e.	Emitter : non diffuse	x		154
	Target : diffuse		x	155
	Audience : diffuse	x		156
f.	Mobility		x	157

Conclusion

Let it be assumed for the moment that the theoretical model presented does provide an adequate basis for a systematic and relatively comprehensive analysis of classroom setting behaviour. Then it may be claimed, irrespective of the validity of the hypotheses put forward here, that a certain utility resides in the enterprise.

Given a definitive description of the nature of classrooms then the following advantages may be anticipated. First, greater precision may be injected into the process of classroom evaluation because a "base line" is available against which each classroom may be measured. Second, the actual evaluation of educational goals themselves becomes more feasible. For instance, in the case of a given classroom adequately realizing selected goals (however they may be defined), then other concurrent characteristics or qualities, desirable or undesirable, can be identified and weighed in the balance as well. Third, of considerable empirical interest, is the prospect of providing a basis for the identification of similar kinds of classrooms and the consequent matching of classroom samples on a less ad hoc basis than is currently customary. Such a prospect, fourthly, opens up the possiblity of evaluating induced change by providing the basis for comprehensive "before and after" judgments of behaviour in classroom settings. The consequent implications for methodological reform, the introduction of new media, new plant and equipment, the reduction of class size, etc., are more than mildly important. Should these prospects indeed be realised then the pragmatic merit of the theory would need no argument.

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CHAPTER VI

SOCIAL SOLIDARITY IN THE CLASSROOM

Paul C. Rosenblatt

Problems faced by teachers in attempting to maintain control in the classroom may be viewed in many ways. The perspective to be used here is that of a theory of social solidarity. This perspective is a limited one, leading to the ignoring of important influences on classroom control. It is hoped, however, that this limited perspective will lead to clear-cut and testable predictions about the origins and effects of classroom solidarity.

Among the many terms that might be used as synonyms for social solidarity are integration, cohesiveness, and unity. One might say that social solidarity is an inferred coherence through a social entity. Solidarity may usually be operationally indicated by commonality of allegiances and attachments. Such shared allegiances and attachments may involve mutuality of friendliness, agreement on things important, aid among entity members, and frequent inter-communication. In order for one to be able to say that a large amount of solidarity exists, it is especially important that shared allegiances or attachments exist across actual or potential subentity boundaries.

Solidarity has been conceptualized and operationally defined in many ways throughout the history of the social sciences (see, for example, Cartwright & Zander, 1960, Part Two; Etzioni, 1961, ch. 8; and Libo, 1953).

One of the persisting problems in solidarity definitions is whether or not expressions of social solidarity are single-factored. It is conceivable that many factors that have been used in solidarity definitions may occur with but imperfect correlation. It also seems likely that forms of solidarity expression vary with task variables. Thus, it may also be the case that various forms of solidarity expression are functionally equivalent and, as a consequence, are more nearly interchangeable than co-occuring.

Social entities may also differ in the concentration of their solidarity bonds. In some entities solidarity bounds may be of approximately the same density and intensity throughout the entity. In other cases there may be a core of strong bonds of solidarity with bonds steadily weakening as one moves closer to the periphery of the entity, or there may be several separate cores of dense solidarity bonds.

If solidarity is measured on the basis of the entity-wide distribution of bonds of friendliness and allegiance or attachment, a methodological difficulty arises. Is it possible to identify the boundaries of an entity independently of the distribution of bonds of friendliness and allegiance? Campbell (1958) suggests, by presenting a variety of indicators of entity boundaries, that determination of entity boundaries by use of measures other than the distribution of bounds of friendliness and allegiance is potentially possible. However, to the extent that it is not possible, measures of solidarity based on the distribution or intensity of solidarity bounds will vary artifactually as a function of the researcher's definition of the social entity. One way out of this methodological bind is to limit one's researches to those entities whose boundaries can be defined independently of bonds of friendliness and allegiance or attachment; to study entities whose boundaries are set by tables of organization, by insurmountable barriers of geography or language differences, or by widely recognized political, social, cultural, economic, or other bounds. Classrooms may be said to have definite boundaries that are usually coterminal with the walls of its enclosing room, hence classrooms are useful entities for investigation of the processes of social solidarity.

At some point in the development of a research program aimed at developing a theory of social solidarity one must make a number of decisions about the operational definition of solidarity. While some initial decisions must be made arbitrarily, others are shaped by one's initial conceptualization. Discussion of this latter type of decision would seem to be useful in elucidating the concept of solidarity.

As has already been indicated, social solidarity may be multifactored. It would be helpful, therefore, for any investigation of social solidarity to use multiple measures. In fact, it can be argued that only when independent measurements are made of a specific property can one be at all confident that the property exists independently of artifacts of measurement (Campbell, 1960; Campbell & Fiske, 1959). For the development of a social solidarity theory of broad applicability the various measures used must be positively (and not artifactually) correlated.

It also seems likely that the solidarity of an entity is sensitive to relations with externalities. Solidarity in the classroom, for instance, is likely to reflect changing conditions in the morale of the school or the personality of the school principal. If this is the case, it behooves any investigator to be as circumspect in his measuring of solidarity as it is possible to be. As soon as the investigator establishes a social relationship with any or all members of an entity he may be altering the solidarity of the entity. Ideally, then, an investigator should measure solidarity without confounding or combining the measurement processes with the independent variables under study.

Classroom Solidarity

Hypotheses about the likely effects of teacher-pupil and inter-pupil solidarity on pupil behavior are discussed in this section of the paper. Usually in the social sciences such discussions are designed to present specific applications of relatively general principles. Unfortunately, a classroom contains a social system that is scarcely paralleled elsewhere. The combined characteristics of this system, such as knowledge transmission and acquisition as major functions, large differences in power and in age-ascribed status, coercive restraints on all participants, and both collective and individual products, are so unusual as to make treatment of the classroom as an examplar of some broader social form only marginally valid. Thus, while particular ideas presented here may come from literatures outside of education or be applicable to situations other than the classroom, no clear lines of inference can be suggested for generalizing the material presented here to other settings. Perhaps this uniqueness of the classroom as a social system is one reason for the relative paucity of work on the classroom by other than educationists.

Application of the word "solidarity" to relations between position occupants differing in task-relevant status is unusual; the term has previously been used primarily for describing relations among people of equal status. "Solidarity" is used here to describe relations among people of differing status precisely in order to emphasize that attitudes and orientations may be shared or reciprocated across role and status boundaries. In Etzioni's terms (1961, p. 177) we shall be attending to both peer cohesion and hierarchical cohesion.

Effects of Teacher-Pupil Solidarity

The extent to which a solidarity relation exists between teacher and pupils can be expected to influence the degree of responsiveness and the kinds of responses pupils make to the teacher. In the absence of teacher-pupil solidarity, the teacher would seem to be less likely to be used as a model for emulation by pupils, while in the presence of solidarity he may well be used. For instance, Bandura (1962) reports that imitation in children is associated with a history of being rewarded by the model, and Knapp & Goodrich (1952) report that warmth is one of the characteristics of college teachers who served as models for undergraduates who subsequently become scientists.

In the absence of solidarity, communication of information and sentiment may be more difficult (K. Deutsch, 1953, ch. 4) and less likely to occur (Festinger, 1950). There seem to be at least two reasons for this. First, communication is probably less important to the parties involved. Neither partyis greatly dependent on the other for the affective or informational products of interaction. Second, there may not be an adequate body of shared experience and values on which to base effective communication. Neither party may be able to empathize with the other. With neither party understanding well why the other considers important what it does in fact consider important, each is relatively likely to annoy the other with behaviors and behavioral demands that seem to the other to be uninteresting and unprofitable. The annoyance not only does not promote solidarity, it serves to suppress solidarity tendencies that could be created by interaction that does occur and by similarity of experiences in a shared environment.

In the absence of solidarity, a relatively large proportion of student interactions with the teacher are probably punishing to students. One assumption that would support this hypothesis is that the teachers in a classroom with low solidarity might feel less compelled to be friendly and tactful. There should also be fewer deterrants to the expression of hostility, since no valuable relationship will be damaged and no well-liked person injured by its expression. Moreover, students in a classroom with low solidarity probably conform to teacher demands infrequently; thus, they lead the teacher to perform punishment and frustration-produced behavior more often. Another factor that might contribute to the hypothesized punitive character of teacher behavior when solidarity is low is that students in low solidarity classrooms might issue relatively few inquiring or approval-seeking messages. If this were so, answers to questions and approval would be less frequent forms of teacher responses, and negative sanctions would appear to be more frequent as seen by the student.

One might apply Etzioni's (1961) analysis of compliant behavior to the situation in which the teacher forces compliance by punishment and threat of punishment. This analysis leads to the hypothesis that when students respond to teachers as punishers the learning of both conventional school material and controlled responses is less complete than when it is based on positive incentives. While one would expect punishment and threats to produce compliance only while the teacher is present, non-punitive control might well lead to behavior conforming with teacher-approved norms even when the teacher is not present.

A second possible consequence of student response to the teacher as a punisher is that responses the teacher is trying to shape may be imprecise. Students may respond only well enough to escape punishment and may be uninterested in perfection. A third possible consequence is that the punishment and threat of punishment may serve as distractors. Student attention may be more nearly focused on potential dangers, less on correct ways to behave. Finally, at least for the highly anxious student, punishments and threats of punishment may well be disruptive, producing relatively poor performance.

In the absence of solidarity children may not only fail to learn what is proper, they may find it rewarding to learn to be deviant. A larger proportion of social reinforcements in the classroom probably come not from the teacher but from fellow students. If the teacher offers reinforcements for nondeviance while fellow students offer reinforcements of deviance, the behavior acquired is likely to be that reinforced by fellow students (Etzioni, 1961, ch. 8; Festinger, 1950). Punishments available to teachers in our society are often inadequate to balance the effect of superior reinforcement potential of a student's contemporaries. In fact, it may well be that teacher punishments reduce teacher-pupil solidarity even further, the aversive stimulus from the teacher coming to serve as a cue to respond counter to teacher-approved norms and stimulating the student to retaliate against the teacher (Church, 1963; Martin, 1963). In addition, the aversive stimulus from the teacher may serve to magnify the difference in attractiveness or reinforcement potential between teacher and fellow pupils. Moreover, both balance theory and the principle of stimulus generalization lead to the prediction that things associated with the teacher by the student, such as books, libraries, educational programs, museums, and law-abidingness, may be rejected by pupils if teacher-pupil solidarity is low. (Balance theory suggests that if students dislike a teacher and the teacher is perceived to like such things as books and libraries, then students will dislike books and libraries--see Abelson & Rosenberg, 1958; Festinger, 1957; Heider, 1958; and Osgood & Tannenbaum, 1955. The principle of stimulus generalization suggests that if students perceive a teacher to have properties in common with books and libraries, students will react to books and libraries in the same way that they react to the teacher--see Kimble, 1961, ch. 11.)

In classrooms with high teacher-pupil solidarity teachers may also be expected to remain friendly towards deviators following a disciplining or correcting incident. Such teacher behavior should be effective in producing desired behavior in that it will tend to maintain a reliance on the teacher for approval and that it will make clear to the pupil which behaviors are disapproved and which are not. Post-control friendliness by the teacher should also minimize the degree to which the offending student perceives himself to be publicly confronted in this deviance. To the extent this is the case, the teacher who remains friendly to a deviating student circumvents the possibility of position-solidifying responses associated with confrontation (Gerard, 1964).

If, as was suggested above, one can find conformity to teacher-approved norms in classrooms with high solidarity, even when the teacher is not in a position to exercise sanctions, teacher trust of pupils would seem likely to be strong in classrooms with strong teacher-pupil solidarity. Such teacher behavior is probably useful in maintaining control because group members are relatively well motivated to fulfill the expectations of others when those others are sources of reinforcement (M. Deutsch, 1962). A number of books on teaching support the notion that teacher trust is to be recommended, within limits (see, for example, Blair, Jones & Simpson, 1962, pp. 416-428; Harrison & Gowin, 1958, p. 141; Kelner, 1958, p. 72; Melvin, 1933). When students are more trustworthy, teachers should tend to be more friendly--which will promote additional solidarity; and when teachers are more trusting, students should tend to be more friendly--which will also produce solidarity.

Another advantage of high teacher-pupil solidarity in the maintenance of control is that such teachers are likely to be alert to the unusual (shy, dull, day-dreaming. . . .) child who might well be left to his own, self-generated activities by a less sensitive teacher. Such teachers should also tend to maximize pupil involvement by anticipating and correcting for pupils loss of interest in the task at hand due to boredom, fear, or other sources of distracted behavior. Thus not only is it reasonable to presume that alertness on the part of the teacher leads to teacher-pupil solidarity, but also a climate of strong solidarity pushes the teacher to work hard for its maintenance.

Up to a point solidarity relations between teacher and pupils should facilitate school learning; it is also reasonable to presume that with too much teacher-pupil solidarity learning falls off. On the one hand, the teacher who is never friendly, agreeing, loyal, or helpful (1) tends not to give pupils adequate information about what is correct, and (2) tends to be treated reciprocally, in unfriendly, non-agreeing, disloyal, and unhelpful fashions. On the other hand, the teacher who is invariably friendly, agreeing, loyal, and helpful may be ineffective because the pupils (1) are not always given adequate information with which to discriminate right behaviors from wrong, (2) are led by the teacher's permissiveness to believe that they may perform a variety of behaviors that are incompatible with school learning, (3) find the ambiguity of standards unpleasant, and (4) may lose respect for the teacher (Estabrook & Karch, 1943).

It would seem that the optimal level of teacher solidarity behavior varies with the range of acceptable pupil behavior. Relatively intense friendliness, agreement, loyalty, and assistance would seem to be most effective with kindergarten and primary grade pupils, who are relatively unaware of standards of acceptable behavior and with students in creative courses, where a wide range of task-relevant behavior is tolerable. To the extent that women in our society tend to show more friendliness and helpfulness than men, and to the extent that teachers in general are less than optimally friendly and helpful, women are more effective teachers in these two kinds of situations than men.

An optimal level of teacher solidarity-expressing behavior would seem to be valuable on several grounds. (1) It allows teachers leeway to reward approved and ignore or punish disapproved behavior, thereby facilitating pupil discrimination of desired behavior from undesired. (2) It makes teacher approval valuable to the pupils because it comes from someone who is relatively well liked and is not continuously given. (3) It is difficult to give hypocritically, for friendliness, agreement, loyalty, and helpfulness would seem to be hard to simulate; with moderate solidary behavior by teachers, rewards tend to be credible and genuine.

A curvilinear relation between teacher-pupil solidarity behavior and classroom learning might also indicate several things about the effect of pupil solidarity behavior on learning. (1) Pupils who express no solidarity behavior are unresponsive to instruction; the learning that they gain from classroom experiences may not correspond to the learning the teacher is trying to produce. (2) Pupils who express intense solidarity behavior tend to be so responsive to the teacher that (a) they may develop little initiative for acquiring knowledge or for doing novel things, (b) they may require overly detailed and careful instructions in order to carry out a novel assignment, and (c) their classroom acquisition of knowledge may tend to be limited to those few things on which the teachers can focus their attention.

It would seem that the optimal level of teacher-pupil solidarity varies with the degree to which the students can accomplish learning without being taught. Presumably, as the student becomes better educated and more sophisticated, he can and must be relatively less friendly, agreeing, loyal, and helpful to teachers. Assuming that one aim of education is to produce self-educating, thoughtful, creative individuals, the more educated an individual is the less inclined he is to need or to accept suggestions, advice, and direction from teachers. The less the advanced student needs teacher friendliness, agreement, loyalty, and help, the more use he can make of instructional media that require little contact with a teacher. Students who are not advanced may be hindered rather than helped by instructional devices that require little contact with a teacher; however, this effect is likely to be less so with devices that have rewards for correct responses and error-correction built in. Advanced students may, by the same token, be less pleased with and helped by instructional devices that have rewards and error-correction built in. Thus, questions about the effectivness of media of instruction should be answered separately for different levels of educational development, for different amounts of teacher involvement in the use of the media, and for different degrees of reward and error-correction on the part of instructional devices.

To the extent that teachers are resource persons and certifiers that learning has occurred, students need teachers. Since the typical human being requires some friendliness, agreement, loyalty, and cooperation from others in order to remain motivated to do something, students would seem to maintain teachers by expressing at least some solidarity behavior. Thus it seems likely that unresponsive students tend to produce strong teacher dissatisfaction and a high teacher drop-out rate.

Effects of Pupil-Pupil Solidarity

The extent to which solidarity exists among the pupils may influence the amount of work the teacher has to do and the degree to which certain strategies of control are effective. Where high inter-pupil solidarity exists, the teacher may more effectively control the class by manipulating the class as a whole. Teacher rewards of the behavior of one student would seem to be likely to influence the behavior of others, and it is probably easier to control the class by addressing the class as a whole. However, high inter-pupil solidarity also creates problems. Given high solidarity teasing or otherwise embarrassing an individual child may be more painful to the child, and may have undesirable side-effects. The class may be more likely to conspire against the teacher, and those who would tend to deviate in the direction of greater compliance with the teacher's demands and of higher quality performance may be more likely to hold back, to attempt to avoid negative sanctions from classmates.

Sources of Classroom Solidarity

Solidarity, like any other form of mutual loyalty, is influenced by many factors. Trow (1960, p. 607) provides a brief summary of the factors contributing to group loyalty in an article written for educators. Numerous of these factors have been reviewed elsewhere with special reference to ethnocentrism and nationalism (Rosenblatt, 1964). While some of the factors reviewed are idiosyncratic to ethnocentrism and nationalism, many affect mutual loyalty in a wide variety of situations. A terse summary--Rosenblatt's conclusions regarding factors leading to solidarity--might read as follows: Mutual loyalty or solidarity is greater the more similar group members are to one another on any dimension, the more familiar they are to one another, and the greater the magnitude and universality of satisfaction of individual needs within the group setting. Assuming that for the typical school class in our society an increase in solidarity would have a salutary effect on control and learning, a number of hypotheses would seem to follow.

If similarity promotes solidarity, it would seem to follow that learning and control are increased when a class is relatively homogeneous in membership and when the instructor is relatively similar to the students. Since too much solidarity appears to be detrimental, the qualifications ought to be added that complete homogeneity of class membership or extreme similarity between instructor and students can be expected to be dysfunctional.

If familiarity promotes solidarity, it follows that the longer a class has been meeting together the greater the solidarity, or the longer class members have known one another the greater the solidarity. From this perspective it would seem that the practice followed in many schools of moving the same group of students to a new teacher each year would promote an undesirable schism between the relatively cohesive group of students and the relatively unfamiliar teacher. It would seem worthwhile to keep a teacher with a class for a longer time, or if school enrollment is great enough, to shuffle the memberships of several classes before assigning students to new teachers. It would also seem to be worthwhile to acclimate students to teachers by allowing future teachers to take classes for a number of sessions preceding change in teacher. In order to avoid the undesired schism between students and novel teacher, acclimatization might best take place in the presence of a teacher familiar to the students.

It is reasonable to assume that interaction does promote solidarity. As interaction goes on, mutual expectations are built up. While expectations of what behavior will occur are more conducive to solidarity relations, even expectations of what will not occur promote solidarity. Expectations need not even be of desirable behavior, for expectations of any sort tend to produce a modicum of comfort when compared to feelings associated with uncertainty. Another reason why interaction promotes solidarity is that the human imagination tends to lead to misperception of strangers. This misperception almost always adds a constant error in the direction of negative evaluation; i.e., people are prone to guess that strangers are more unpleasant than they turn out to be once interaction with them has occurred.

It might also be expected that relatively anxious people anticipate discomfort or injury as a result of interaction more often than such discomfort or injury occurs. For such anxious people, interactions tend to be rewarding in that they lead to harm less often than anticipated. Since anxious people do find interactions relatively rewarding, they can be expected to be involved more often in solidarity relations. Moreover, if one assumes that interaction tends to bring expectations progressively closer to reality, it can be expected that the solidarity relations developed by relatively anxious people should be more noticeable during early interactions with people previously strangers than during later interactions.

If satisfaction of needs is important, then the teacher who provides for student needs for novelty, physical activity, comfortable room temperature, dependence, independence, and so on is relatively effective at producing control and learning. Moreoever, students who satisfy teacher needs for achievement, affection, and so on establish a relation with their teachers that is conducive to control and learning. The caveat should be added that if the focus of class activities shifts from control and learning to need satisfaction, one might expect relatively poor control and learning.

A source of solidarity that is rarely tapped in American schools is competition or conflict with other groups. If an increase in solidarity produces desirable outcomes, then promoting competition or conflict between classes or between a class and some other entity will be at least partly functional. Naturally, the teacher must be alert to undesirable side effects such as overt physical conflict or primitivization of output that may occur under intense motivation, but with these reservations in mind one might suggest a number of kinds of conflict or competition that would promote solidarity and consequent control and learning.

The first type is inter-class competition over the quality or quantity of some output that can be objectively compared between classes. Such competition is much more feasible between classes at the same grade level and of similar distribution of abilities than otherwise. In order to maintain motivation at a high level competition might best be over recurrent class outputs such as spelling papers, arithmetic papers, writing papers, or "project" workbooks.

Another type that should be considered is class-administration conflict over allocation of resources such as paper and books or over satisfaction of needs such as need for comfortable temperature. How does one reconcile the recommendation of this form of conflict which involves the nonsatisfaction of needs with a previous assertion that solidarity is greatest in the class which provides the most need satisfaction? The point should be made that loyalty to an entity is probably unimpaired when something outside the entity is perceived as the source of deprivation and when one cannot change one's membership in the entity. Thus the teacher who can take the side of the pupils in a clash with the school administration may promote within-class control and learning. Among the warnings that might be issued at this point is one to the effect that good teacher administrator relations are useful to the teacher, so any use of administrators as scapegoats must be done under a collusive agreement between teacher and administration. Another warning that might be issued is that the teacher must beware of students who attempt to reverse manipulator-manipulated roles with the teacher, who attempt to manipulate the teacher or the administration by appearing to back the one in a conflict with the other.

Intra-class competition may also be useful in promoting control and learning. If the competing units are evenly matched, if the goals of competition are so rewarding and numerous that student interest can be maintained, and if the goals of competition are adequate to maintain motivation but not so desirable that extrinsic motivation would suppress real or potential interest in the task, high intra-unit solidarity and consequent sustained performance at a high level is likely to occur. One latent function of competition is to encourage an evaluative attitude on the part of the students (Bronfenbrenner, 1962). Potentially harmful effects of competition might be dealth with by uniting competitors at a lower level of social organization in competition at the next more macroscopic level.

Research on Solidarity

Surely the first moves in the investigation of solidarity should be the development of operational definitions and the validation of constructs. Measures of mutual friendliness, agreement on things important, and mutual aid should be developed. If solidarity is a valid construct, these measures should be found to be positively correlated with one another.

Assuming that construct validation has occurred, investigations can proceed in the directions of correlating solidarity with educational achievement, of studying whether or not the solidarity indices are responsive to factors that are hypothesized to influence solidarity, and of analyzing specific mechanisms operating to produce solidarity or to produce the effects of solidarity on learning.

The present paper has been intended as a suggestive, not a systematic or exhaustive, discussion of an aspect of social groupings, particularly of classrooms. Needless to say, not all implications have been discussed, not all boundary conditions have been specified, and not all variance in dependent variables has been accounted for.

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CHAPTER VII

TEACHER ROLE: CONCEPTIONS AND BEHAVIOR

Bruce J. Biddle, Graeme S. Fraser and Jerald M. Jellison

The purpose of this paper is to discuss the relationships between conceptions held by teachers for their professional role and the role behaviors they exhibit. The paper begins with a short exposition of role concepts necessary to discuss the role of the teacher. This is followed by reviews of empirical research conducted to date on teacher behavior and concepts held for teacher role. Finally, a set of propositions is then advanced predicting relationships between these two realms.

This paper violates and questions one of the common-sense assumptions of role theory: that role concepts and role behavior are similar. This assumption not only appears in theories of social integration but has also stood behind many studies of teacher role conducted to date. For instance, Soles (1964) has suggested that, "An index designed to measure role expectations held by teachers for themselves is assumed to give a somewhat better than chance prediction of actual role behavior." Again, Sorenson,

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A few materials herein are paraphrased without reference from an earlier bibliographic review of teacher role studies (Biddle, Eveloff, Rankin, Twyman, and Warshey, 1961, Chapter V) that was prepared under the direction of Earl F. Rankin, Jr., to whom thanks are owed.

Husek, and Yu (1963) hypothesize that, "The teacher behavior of a teacher or teacher candidate may be predicted from his role expectations." And again, "... if I know the roles [expectations] in a given ... educational institution, I can make some rather accurate predictions of what the people in these institutions do without ever observing the actual people involved" (Getzels, 1958). That this assumption has been challenged by both theorists (see Homans, 1950; Merton, 1957; Goffman, 1959; and Wrong, 1961) and empirical research (Schanck, 1932; Wheeler, 1961; Biddle et al 1966) has not stopped investigators from suggesting the equivalence of teacher role conceptions and role behavior. Rather than accept this assumption, the present paper asks the question: in what ways are conceptions held by teachers for their role and their actual behaviors likely to be similar or distinct? Among the many determinants of teacher behavior, what part is played by role conceptions held; among the many determinants of teacher role conceptions, what part is played by behaviors characteristic of the teacher?

The topic of this paper is related to but distinct from other familiar concerns of role theory. Since concern is given to relationships between role conceptions and role performances, this paper relates to theories of conformity, role conflict resolution, and social preception. More specifically, the relationships between role concepts held and role performances exhibited by small group members have been investigated both theoretically (Foa, 1958) and empirically (Borg, 1960). However, as shall be shown, the position of the teacher is structurally different from that of the group member -- suggesting unique predictions for the teacher. Predicting role behavior from role concepts may also be seen as a sub-topic of the more general field, predicting role behavior from personality (See Mann, 1959). Coverage will be limited here, however, to considering only those aspects of the teacher's personality expressed as conceptions held by the teacher about his professional role.

This paper should also be seen as relating to the larger problem of determining the causes of teacher classroom behavior. In part the behavior of the teacher must respond to environmental pressures, to situations in which the teacher is involved and to the demands placed on the teacher by others. In part, however, the teacher's behavior must also be caused by internal processes, by motives, attitudes, needs, and role conceptions held by the teacher. In a related paper (Biddle and Adams, 1966) the senior author suggests that teacher classroom behavior interacts with characteristics of the physical and social environments and with pupil behavior in the classroom. In this paper the behavior of the teacher is seen as interacting with teacher-held role conceptions. Ultimately one would hope to examine the interactions among these various behavioral determinants so as to create a viable, empirically-based theory of the teaching process.

Basic Role Concepts

Role theory may be said to concern itself with patterns of social behavior that are characteristic of persons who are members of identifiable social positions and with the conceptions they -- and others -- hold about those behaviors. Its subject matter is, thus, of interest not only to educators but all those who seek to understand human behavior in social contexts. Role theory has several distinct drawbacks at present, however; among them being a persistent confusion in terminology and a paucity of explicitly stated propositions. For convenience, the terminological conventions suggested by Thomas and Biddle (1966) will be adopted here, while portions of this paper deal explicitly with propositions predicting teacher role conceptions and behavior.

The Transitor

Perhaps the most basic of all role concepts is that of the transitor or referencing statement. Reports of the form, "John brushes his teeth," "Mary went to England last year," "Bill does not think well of me"; demands, such as "Don't cross the street when the light is red"; evaluations, for instance, "I don't like pea soup" -- all are transitors. Role conceptions are also examples of transitors, as are (some forms of) role performance. Transitors differ from one another in many ways. They are expressed in various modalities -- as norms, for instance, or as anticipations; they reference many aspects of the world; they are enunciated by individuals or, in consensus, by group members; they apply either to individaul or to social positions; they are laid within various contexts; they are presumed to be held covertly, or are volunteered, or are given in response to the questions of social investigators. In order to understand role conceptions held for the teacher, it is necessary that we consider these distinctions in detail.

Modality

Transitors may be expressed with any of several modalities. Some transitors are demands ("Johnny, wash your face now"), others are descriptions ("tomorrow is Tuesday"), others are questions ("What is the name of that fish?"), still others are evaluations ("I don't like spinach"). Sometimes transitive modality is clear, as in the above examples; at other times it may be ambiguous. For instance, is the phrase, "I expect you to eat your dinner," a report, a demand, or an evaluation? Despite such occasional unclarities, transitive modality represents one of the basic dimensions which define a transitor. Without modality the transitive (reference) act ceases to have existence. In this paper we shall concern ourselves primarily with demands and reports enunciated for the teacher.

Reference

That which is referenced in a transitor (its "content") is also a primitive quality of the transitive act. Transitors may reference behavior ("Johnny, you should eat your potatoes"), persons ("I like Mary"), non-human subjects ("I like dogs"), physical equipment and its usage ("turn on the TV, please"), impersonal events

("Constantinople fell in 1453"), and non-observable phenomena ("I don't believe in ghosts"). Some transitive forms may be simple, as in the above examples, others may be complex and filled with contingencies ("Returning residents are granted a $100 exemption after a stay abroad of at least 48 hours, except in the case of residents returning from Mexico or the Virgin Islands of the United States."), still others may be unclear in all or portions of their content ("I have a vague feeling of discomfort, doctor"). However, all transitive acts have discriminable references, as they do modalities, and a shift in either modality or reference marks the act boundary.

By convention, role theory is usually (although not always) confined to transitors that have as their reference human characteristics. Thus, although people almost certainly maintain -- and use -- conceptions for the weather, the behaviors of pets, and the operation of physical equipment, when speaking of "role," we normally assume transitive reference to behaviors or other characteristics of persons or social positions. When speaking of the role of the teacher we generally reference characteristics of a teacher or the teacher position.

Various human characteristics may be referenced in role transitors. Among the most prominent are: features -- relatively unchanging, physically-based characteristics over which the individual has but minimal control such as age, sex, race, or state of infirmity; traits -- characteristic patterns of behavior; covert processes -- values, norms, or other internal states presumed (by the speaker) to characterize himself or others; backgrounds -- experiences presumably suffered by the other such as social class or nationality of origin; and performances -- overtly revealed behaviors. As will be seen in the review of previous studies of teacher role, investigators have concerned themselves with conceptions for each of these forms of teacher characteristics.

Performances

A basic distinction is made in role theory between the covert and overt expression of role transitors. A teacher expresses a transitor overtly when we observe him enunciating a transitor in some real-life situation; for instance, when the teacher says to a child, "Johnny, put your hand down." The set of all overt enunciations of transitors (that is, the set of all referential statements) constitutes a large portion of the observable acts of a teacher. Teachers may often be observed to state, to demand, to question, to evaluate. Moreover, transitors are "natural" units of behavior; they have easily identifiable boundaries that can be recognized -- boundaries given by a change of modality or referenced material.

It should not be assumed that all observable teacher behaviors are transitive in nature, however. First of all, some teacher performances are non-referential. Teachers may laugh, sing, raise the shade, say "ouch," hammer, or point. Each of these acts, though also a "natural" unit of behavior, cannot be judged in terms of transitive modality or reference, although it may imply covert, transitive processes that are as yet unexpressed by the teacher. Moreover, teacher behavior may also be judged using concepts that apply to molar sequences or molecular sub-parts or behavioral acts. Teachers may be observed for their "lecturing style," their "use of logic" or "democratic practices" -- using analytic concepts that may or may not even be understood by the teacher-actor.

It is, thus, convenient to differentiate teacher behaviors into transitive and non-transitive components. It should be pointed out, however, that transitors enunciated _about_ teacher behavior (by teachers or others) may reference either the transitive or non-transitive components of teacher performance.

Conceptions

It is also presumed in role theory that persons hold a number of private transitors that are not normally enunciated in real-life situations. Teachers have judgments about behaviors that are appropriate and inappropriate for their pupils. They also anticipate certain patterns of performance for both pupils and themselves, and the like. I shall call such covertly-held transitors _conceptions_. The conceptualized demand will be called a _norm_, while an _anticipation_ is a conceptualized description.

Whereas it is easy to operationalize performances (we need merely observe them), the operationalization of conceptions requires one or more assumptions. Most role investigators have assumed that subjects are able to reveal their conceptions in response to questions asked in interview or questionnaire. Thus, the usual (direct) measure of role conceptions has been one which requires subjects to respond to a standard set of stimuli in a way that purports to reveal, honestly and veridically, characteristics of his conceptual world. Various techniques have been used to elicit such reports of role conceptions, and as we shall see, these techniques differ not only in methodological assumptions but also in their implications for relating role conceptions to role behavior. In particular, some measuring techniques have built-in biases that lead to non-veridicality in conceptual reports, regardless of the honest intentions of the subject.

Other Transitive Properties

Modality and those human characteristics referenced are not the only judgeable properties of role transitors. Indeed, transitive acts may be judged for many qualities beyond those of the dimensions which define them. They may be delivered, for instance, with enthusiasm or timidity, with various accents, with stammering, with emotional overtones. Each of these is an additional, observable characteristic of transitive acts. Such characteristics do not define an act, although they may so circumscribe the act-gestalt as to constrain or even reverse the apparent meaning of the modality-referent. For example, the phrase, "I hate you," delivered with a grin or tender expression may mean quite the opposite of its apparent content to the target person. Again, the discussion of an algebraic theory may be delivered in such a manner so as to convince the other that he is despised, loved, or ignored by the speaker.

Another, quite different property of transitor references is their context. Note that in the demand, "Teachers must discipline firmly pupils who do not pay attention," it is specified that when (and only when) the teacher is faced with lack of attention on the part of a pupil that firm discipline is called for. Contexts specify any of various, possible contingencies in which behavior may take place: time or place, social occasions, specified behavioral contingencies, functions or goals the actor is promoting, specific persons who are targets of or audiential to the act discussed, and the like. Barker and Wright (1955) have demonstrated clearly that transitive acts (and other act types) are severely constrained by contextual settings. It is also reasonable to presume that conceptions held for role performance are contextually circumscribed, although often the subject who enunciates a role transitor "leaves out" contextual specifications on the assumption that they are clear to the listener from prior communication.

Extended Transitors

As was illustrated in earlier examples, transitors come not only in simple forms ("Johnny, put your hand down") but may also be observed to exhibit complex structures in which more than a single modality and reference appears ("In my opinion, the principal is wrong in demanding that teachers come to all PTA meetings!") Transitors of this latter variety reference other transitors, and we shall term them extended transitors.

Extended transitors of various types may be observed. For instance, performance transitors may reference either the transitive behavior of others ("Mary, Johnny tells me that you kicked her") or conceptual properties presumably taking place in others ("Young man, I do not approve of your intentions"). Like simple transitors, they may either be enunciated in actual performances (as is implied in the above examples) or may be revealed by subjects in response to questions asked by an investigator. For instance, teachers may be asked not only to report their own norms but also to describe norms they attribute to other teachers or to their school principal. The modalities of the two, transitive components of an extended transitor may be alike ("I like what you like") or different ("I saw John tell Mary what to do"). Extended transitors may reference either a single other ("Teachers hold norms for their own behavior"), the subject ("Teachers hold norms for me"), or a third party ("Teachers hold norms for their pupils"). Finally, extended transitors may involve but two, sequentially-ordered transitive forms (as in all of the above examples) or may involve longer sequences ("I know that the parents of my pupils have strong feelings about how our principal should feel about a teacher who dislikes pupils").

Extended transitors have certain inherent characteristics. It is useful, for instance, to separate analytically the lead transitor from those which follow it and the terminal transitor from those which precede it. When extended transitors are enunciated, the modality and subject of the lead transitor are observed directly. This is equivalent to stating that when the teacher reveals his values, beliefs, or norms we know (a) that it is the teacher speaking, and (b) the modality that he enunciates. However, all other persons and modalities appearing in the extended transitors are references; we know about them only to the extent of their reference in the statement. Should a teacher tell us about the norms of his principal, for instance, these may or may not correspond with the norms actually held by the principal; indeed, for the psychotic respondent, there may be no principal at all.

It should also be noted that extended transitors may also terminate with reference to various types of events, but by convention, role theory is concerned only with extended transitors whose terminal transitor references human characteristics. When examining conceptions held for the role of the teacher, we are normally concerned not only with simple norms, values, and assertions made by subjects about the characteristics of teachers, but also with norms, values, and other conceptions and performances attributed by subjects to others for the characteristics of teachers.

Transitive Sequences

There is another way in which transitors (both simple and extended) may be seen to be related. As enunciated either by one person, or by several persons in interaction, transitors often form sequences that have identifiable properties. For instance, the threat of a sanction ("If you do that, Johnny, I will spank you!") is a statement that is made up of two transitors, the delivery of one begin made contingent upon the other. Statements of such kinds may be termed *causative*, in the same sense that a warning ("If you put your finger on that stove you will get burned") relates two referenced events in a presumed cause-and-effect sequence. Causative sequences "may" be recognized by their apposition of component transitors; on other occasions a causative sequence is "incomplete" and one or more of its transitive components are "understood" (when, for instance, the teacher merely signals a deviancy or feferences a threat without actually spelling out what the child is presumed to be doing wrong). More often, however, causative sequences are signaled by recognized connecting phrases ("if ... then," or "therefore").

Causative sequences should not be confused with the analysis of transitor *logic*. Causative sequences may or may not be logical, but so may other forms of transitive sequence including sequences of exchange between two or more actors. The analysis of logic in transitive sequences is a field of inquiry in its own right (see Smith, 1960; and Meux and Smith, 1964). And, it should not have to be added, other properties of transitive acts (such as, for instance, the manner of their delivery) may also affect the form of subsequent transitors that are emitted in interaction quite as much as the logic of their contents.

Person Distinctions

Various person distinctions have been used in the foregoing discussion to differentiate among those who hold conceptions, act, and react. It is useful to summarize these distinctions at this time.

Persons who hold conceptions are known as subjects. Normally, subjects are spoken of as single individuals, although it is possible to discover that subjects in various subject groups are alike in the role conceptions they hold. Persons who perform, who emit either transitive or other forms of behavior, are known as actors. (Acts emitted by actors are directed towards target persons and are observed by an audience.) Again, it is possible to distinguish among individual actors and various actor groups. Finally, persons who are referenced in transitors are termed objects. Although it is possible to speak of transitors held for individual object persons (indeed, we shall deal explicitly with this form presently) most role transitors are expressed for object positions.

A position is a classification of persons that is commonly recognized in a given social setting and which is referenced by a distinguishing designation. Thus, "teachers" constitute a position, as do "mothers," "bakers," "policemen," and "teenagers." The classificatory concept, position, references a set of persons, while the descriptive or prescriptive concept, role, references a set of transitors that are enunciated for a position. Persons appearing in transitor references are either identified as individuals (John H. Jones, or "my daddy") or as members of positions ("teachers"), and it is the positional concept that allows subjects to maintain generalized conceptions for classifications of persons.

Subjects, actors, and object persons may or may not represent the same set of people. For one thing, subject persons may maintain conceptions for either their own or others' behavior. For another, it is occasionally unclear what a subject means by the positional designation he chooses for representing an object position. (What group of persons is meant, for instance, by the term, "Communist sympathizers"?) However, it is commonly assumed in many role studies that terms used to represent object positions represent real and easily-identifiable groups of subject or acting persons. Similarly, we shall presume in this discussion that the cast of characters in most institutions of primary or secondary education includes teachers, pupils, the principal (and possible other administrators), the janitor (and other service personnel), and -- at a somewhat greater distance -- parents, school board members, attendees at the PTA, "the public," school superintendents, and the like. Each of these groups of persons may appear as subjects (if we are examining their conceptions) as actors (if their behaviors are observed) or as object persons (if they are spoken of by subjects).

For extended transitors it is necessary to make a distinction among the two or more object persons who may be referenced. I shall adopt the following conventions: the terminal object person is referenced in the terminal transitor, sentient object persons appear in other portions of the extended transitor. Teacher-subjects, for instance, often attributed to their principal (a sentient object person) norms for themselves (the terminal object person). Under normal circumstances, discussions of the role of the teacher would be confined to transitors which have as their object (or terminal object) position, "teachers"; and in this paper the theoretical propositions are restricted to discussing the relationships between behaviors emitted by teacher-actors and the conceptions advanced by those same teachers (as subjects) for the role of the teacher (object) position.

Summary

Role theory concerns itself with the study of transitors -- forms of referential behavior that are characterized by modality and reference to some form of human characteristic. Transitors may either be expressed as one form of overt performance (in which case they may be observed directly) or are presumed to characterize covert processes taking place in subjects (in which case they may be measured by asking subjects to report about them). Transitors have other characteristics including those of manner and contextual specification, they may appear in simple or extended form, and both causative and logical sequences of transitors may be observed in the behaviors of an individual or several persons in interaction. Transitors are enunciated by subjects, behavior emitted by actors, and persons appearing in transitor references appear as objects.

In studying the role of the teacher we would normally look at the behaviors of teacher-actors and at transitors that are enunciated for teacher-objects by various persons. In this paper we are concerned with the relationships between conceptions held for teachers by teacher-subjects and their behaviors as teacher-actors.

Previous Research on the Problem

We turn now to a review of previous research on the relationship between conceptions held for the role of the teacher and actual teacher behavior. This review will be a brief one because of space limitations and the fact that an excellent review of studies of observed teacher behavior has recently been presented by Medley and Mitzel (1964). We turn first to studies that bear directly on the problem of the paper, then to a short review of studies of observed teacher behavior, and finally to a review of studies measuring conceptions held for the teacher role.

Studies Relating Teacher-held Conceptions and Teacher Behavior

In an intensive search of the literature, the author has been unable to find any studies in which (a) teacher role conceptions were measured directly, and (b) teacher performances for these same conceptualized areas were measured by direct behavioral observation. A number of studies were found, however, in which: (1) teacher conceptions were measured by indirect means, and (2) teacher performances were rated. The relationships between these weaker criteria and the desired field of research may be seen in Figure 1 together with references to several studies which exemplify coverage.

		Method Used for Measuring Teacher-held Conceptions	
		Direct	Indirect
Method Used for Measuring Teacher Behavior	Observation		McGee (1955)
	Ratings by Others	Tomich (1963) Bible & McComas (1963)	Ryans (1960) Dunkin (1966)

Figure 1. Studies relating teacher-held role conceptions with observations of teacher behavior.

For instance, McGee (1955) has carried out a study in which conceptions were measured indirectly and behavior directly observed. In this study the author attempted to relate authoritarianism, as measured with the California F Scale (see Adorno, et al., 1950) with patterns of authoritarian behavior exhibited by teachers in the classroom. Observation of teacher behaviors was made by trained observers using an instrument developed by the investigator. By way of contrast, in the classic Teacher Characteristics Study, Ryans (1960) attempted to measure warmth, organization, and stimulation characteristics of the teacher through a self-report inventory and then to assess these same behavioral characteristics through a global (indirect) rating given to teacher classroom performances (see comment on Ryans' techniques below). Recently, Dunkin (1966) has attempted to relate norms and values held by teachers for warmth and directiveness -- again, using an indirect measure -- with ratings given of teacher behaviors in these same fields by pupils. Finally, Bible and McComas (1963) and Tomich (1963) have attempted to relate direct measures of teacher-held role conceptions with pupil- and administrator-ratings of teacher behavior. As a rule these investigators report weak but significant relationships between teacher-held conceptions and their behaviors. It should be re-emphasised, however, that none of these studies bears directly on the problem of this paper. This lack of coverage is surprising -- to say the least.

Studies of Observed Teacher Behavior

The fact that few (if any) studies have appeared relating teacher-held conceptions and teacher behaviors does not mean that these realms have not been studied separately. To the contrary, a sizeable group of studies are now reported in which the behaviors of teachers have been observed in classroom contexts (though few in other settings). A brief list of some of these studies is presented at the end of the article in Bibliography A. We review first the concepts that have been used in observing teacher behavior and then turn our attention to methods that have appeared in these studies.

Concepts Used in Teacher Behavior Studies

It is difficult to make any reasonably restricted summary of the conceptual coverage of studies that have reported the observation of teacher classroom behavior. Not only have investigators used a large variety of instruments, but also the instruments chosen have represented various conceptual approaches. We shall review both the major orientations of studies and provide examines of concepts used to date.

Isolated aspects of teacher behavior. A number of studies reported have focussed on deliberately restricted or isolated characteristics of the teacher. Thus, Johnson (1935) and Kounin and Gump (1958; see also Kounin, Gump, and Ryan, 1961; and Alden, 1959) have focussed on teacher disciplinary techniques; Smith (1960; see also Meux and Smith, 1964); Aschner (1958); and Wright and Proctor (1961) have investigated the logic of teacher presentations; while Harrington (1955) has investigated teacher smiles (!)

Pupil-centeredness. Although technically but another, limited aspect of teacher behavior, a larger group of studies have concerned themselves primarily with the style of pupil treatment by the teacher. Called variously "dominative," (versus "integrative"), "teacher-centered," (versus "learner-centered"), "direct," (versus "indirect"), these studies have focussed on the degree of authoritarianism in the teacher's presentation and have attempted to relate this dimension to pupil morale, learning, and other dependent variables. Studies in this group include those of Anderson and Brewer (Anderson and Helen Brewer, 1945; Anderson and J. Brewer, 1946; Anderson, J. Brewer, and Reed, 1946); Withall (1949, 1951; see also Polansky, 1954); Mitzel and Rabinowitz (1953); Wispe (1951), Hughes (1959); Calvin, Hoffman, and Harden (1957); and Flanders (1959, 1960a, 1960b, 1964). The energy with which this particular dimension of teacher behavior has been pursued has appeared to reflect not only the common training and friendship of many of these investigators but also the recent coincidence of (a) demonstrations in small groups that autocratic and democratic leadership styles could be discriminated and had differential effects (see Lewin, Lippitt, and White, 1939) with the (b) pupil-centered ideology of progressive education.

Pedagogical concepts. Another emphasis that has appeared has been an attempt to use concepts drawn from theories of pedagogy for the direct observation of teachers. Teachers have been described in such terms as "summarizes," "lectures," "encourages," "assigns," "explains," "demonstrates," and so on by such investigators as Barr (1929); Morsh (1956); Wrightstone (1934); and Cornell, Lindvall, and Saupe (1952).

Extended concept sets. Still other investigators have used concepts that appear to represent a wider variety of interest fields, for instance pedagogical and social activities, etc. Typical extended studies have been those of Medley and Mitzel (1955, 1958, 1959; see also Morrison, 1961; Wilk, Edson, Davies, and Chase, 1960; Bowers and Soar, 1961; and Soar, 1962); Solomon (1962); and Spaulding (1963). In these latter studies some attempt has been made to correlate various dimensions of teacher behavior in order to establish patterns of their joint occurrence.

Responsive concepts. Finally, although the majority of studies have conceptualized teacher behavior in absolutistic terms, in a few studies teacher behaviors have been conceptualized to depend on pre-existing conditions -- particularly certain types of pupil behavior. Thus Kounin and Gump (1958) have conceptualized teacher behavior in terms of teacher response to pupil deviancy, while Smith (1960) and Wright and Proctor (1961) have viewed the teacher within a complex conceptualization of interaction in which the responses of both teachers and pupils are jointly analyzed for logical content -- in more or less explicit transitor form.

Coverage of teacher behavior concepts. One way of summarizing coverage of studies that have dealt with teacher behavior to date is to examine the broad fields from which their concepts appear to have been taken or into which results have been summarized by the authors. We have attempted to make such a summary in Figure 2 which details coverage under the headings of Instruction (Pedagogical Style, Logic of Presentation, Verbal Energy, Subject Matter Orientation), Teacher-Pupil Interaction (Response to Pupils, Small Group Encouragement, Management Techniques), and Teacher Traits (Warmth and Humor, Supportiveness, Directiveness, and Hostile, Dominative, or Autocratic).

Several observations may be made about Figure 2. First, although considerable attention has been given to teacher-pupil interaction, few concepts have appeared dealing with the instructional process, particularly with instructional content. Similarly, unexpectedly few studies have appeared that drew their concepts from psychology (studies, for example, in which motives, beliefs, or attitudes were "observed"). Also under-represented are concepts drawn from management exigencies; from the necessities of maintaining discipline, order, and the physical properties of the classroom.

One is also surprised by the degree to which teachers have been conceptualized to date as "purveyors" when popular educational philosophy has long stressed other aspects of the teacher's role. As we shall see below, studies of teacher-role conceptions have stressed such teacher functions as those of counseling, representing the culture, classroom management, and motivating; emphases that are but poorly represented in studies of observed teacher behavior.

	Barr (1929)	Johnson (1935)	Morsh (1956)	Anderson and Brewer (1945)	Withall (1949)	Hughes (1959)	Flanders (1960)	Wispe' (1951)	Calvin et al (1957)	Medley and Mitzel (1955)	Harrington (1955)	Wrightstone (1934)	Spaulding (1963)	Kounin and Gump (1958)	Smith (1960)	Wright and Proctor (1961)	Cogan (1956, 1958)	Solomon (1962)
Instruction per se																		
Pedagogical Style	X		X	X	X	X	X	X	X	X		X			X	X	X	X
Logic of Presentation															X			X
Verbal Energy										X			X					
Subject Matter Orientation													X			X		
Teacher-Pupil Interaction																		
Response to Pupils						X				X		X	X	X	X	X		X
Small Group Encouragement										X			X					
Management Techniques	X													X			X	
Teacher Traits																		
Warmth and Humor			X								X		X					
Supportiveness		X		X	X	X	X						X					
Directiveness		X		X	X	X	X	X	X									
Hostile or Autocratic Dominative			X	X	X	X	X			X			X					

Figure 2. Fields of coverage in selected studies of observed teacher behavior to date.

It should also be noted that with the possible exceptions of Kounin and Gump, Smith, and Wright and Proctor -- already mentioned -- the majority of studies to date have concentrated on non-transitive characteristics of teacher behavior and often using concepts that would not presumably be well understood by the average teacher.

Methods.

The majority of studies of teacher classroom behavior to date have used one or more behavioral observers who, stationed in the classroom, has assumed responsibility for coding teacher behavior (and often other classroom phenomena) in the form of responses in pre-determined categories. As pointed out by Medley and Mitzel (1964), there are several types of category systems that have been used for achieving reliability in direct observation. Using their terms, a sign system is one in which the observer is given a list of items to check off for occurrence when and if they appear in the classroom. For instance, Morsh (1956) asks observers to check off observations made of teacher behaviors in which teachers "define terms," "ask class questions," "give examples," and the like. Contrastingly, a category system is one in which the items given to the coder are mutually exclusive, presumed to exhaust behavioral alternatives, and are to be rated throughout the occurrence of behavior. For example, in the Withall (1949, 1951) system, observers are asked to make a judgment for each act emitted by the teacher, while in Flanders' (1949, 1960a, 1960b, 1964) system, judgments are made about the behavior of the teacher or pupils every three seconds. (A third type of system, here termed a rating system, may also be found in such studies as that of Ryans (1960) in which the observer is asked to delay judgments until after the classroom session and then to rate behaviors in terms of a series of wholistic judgments. Following Medley and Mitzel (1964), I shall exclude rating systems from this analysis on grounds of inadequate face validity for observational purposes.)

A few observational systems are now reported that were developed for use with audio tape recordings of classroom interaction (see, for instance, Withall, 1949, 1951; Smith, 1960; and Meux and Smith, 1964). One investigator is presently working with sound motion pictures of acutal classrooms (Kounin, unpublished) while a number of investigators (including the author) are presently working with videotapes of classroom sessions. However, studies of teacher behavior using mechanical aids are still in the minority.

Methodological problems. Various methodological problems have appeared in studies of teacher behavior. Some of these are inherent in the nature of the phenomena under study. Others have resulted from the use of certain types of methods as opposed to others.

Turning first to classroom phenomena themselves, it is clear that teacher behavior and other classroom phenomena not only vary enormously from teacher to teacher, from time to time, and in terms of subject matter, facilities, and school regulations, but also that teacher behavior patterns are remarkably unstable and come at a rapid pace. As suggested by Medley and Mitzel (1964) most previous research on classroom behavior has focussed either upon only a minute fraction of the total number of variables that are observable within the classroom or has taken but a small sample of classrooms on which to validate instruments.

The fact that most studies to date have used but a single observer in the "live" classroom has posed additional difficulties. First of all, in simplifying the task of the overloaded observer, many investigators have attempted to elide concepts applying separately to the teacher, the pupils, or to the social system of the classroom as a whole. Thus, observations of "instructional style" have presumed to generalize to "social climate" or to "learning atmosphere" and so on. Secondly, the observer has, perforce, concentrated on but a minute portion of the total web of interaction; on teacher interaction with but a single pupil, for instance. As a result, little information has been gathered to date about the social contexts in which teacher behaviors are emitted or of the wider effects of teacher actions. This difficulty has been magnified by a third problem, the use of record-keeping methods that tabulate only frequencies of occurrence of behavior types within the classroom and ignore behavior sequences. Too many studies report merely the frequencies of behavior types emitted by various teachers or their pupils and neglect to tell us which forms of behavior appeared to produce others (see, however, the contrasting studies of Flanders, 1960b and Smith, 1960).

The difficulties encountered by the "live" classroom observer have led some investigators into spending a great deal of energy examining behavioral observation methods for reliability. Again as pointed out by Medley and Mitzel (1964), there is good reason to presume a certain amount of unreliability to be intrinsic to the observational process, and in the final analysis the establishment of reliability is but the first step in a longer process which has as its goal the discovery of predictive relationships among variable classes involved in the classroom and between such individual factors as role concepts and classroom behavior.

Another problem mentioned by many investigators is the difficulty stemming from teacher sensitivity to observation and the general feeling that it is "immoral" to observe in the classroom. Teachers are accustomed to operating in isolation from other adults and resist attempts to observe their operation, whether by the principal, the performance rater, or the research investigator. In addition, there is some reason to suspect that the presence of an observer in the classroom makes a not inconsiderable difference in the pattern of interaction taking place there. Classrooms are often "on their best behavior" when the visitor enters.

Finally, investigators of teacher behavior have evidenced an understandable concern with applications of findings from observational studies to the immediate solving of problems in the educational world. This aim, however, has meant that certain investigators have chosen methods not for their conceptual sophistication but rather because they could easily be applied in the classroom, could be taught to relatively untrained observers, or could be used immediately in the re-training of teachers (in this connection, see especially Flanders, 1960b). From the viewpoint of the author, research in teacher behavior and other classroom processes is a serious business and should not be confused with the application of findings from research to the amelioration of specific problems - although this latter may be an ultimate aim.

In summary, studies of teacher behavior to date have been plagued by a variety of methodological problems, problems stemming both from the difficulties generated by classroom research and by the use of the single, "live" behavioral observer. As suggested elsewhere (Biddle and Adams, 1966) many of these methodological problems can be solved through the use of mechanical (videotape) recordings made in the classroom.

Studies of Role Conceptions for the Teacher

Of studies of role conceptions held for the teacher there is no end. In fact, by adopting a broad or vague definition for the measurement of "role conceptions" nearly every teacher rating study that is reported in the literature might be reviewed under this heading. Certainly this is a less useful task than that of a more limited review. We shall confine coverage here to only a sample of those studies in which conceptions held for the role of the teacher are studied directly. A brief list of some of these studies is presented at the end of the article in Bibliography B.

Subjects. Of the approximately 70 studies referenced in Bibliography B, the majority took data from school teacher respondents. But interest has also been given to role conceptions held for the teacher by various other persons in the educational institution including university administrators (Trabue, 1953); university professors (Cowan, 1956); university students (Brenner, et al, 1964; Champlin, 1932; Clinton, 1930; Corey, 1937; Haggard, 1943; Harris, 1946; Lamson, 1942; McDonald, 1931; McGill, 1931; Richey and Fox, 1948; Robbins, 1944; Smith, 1944; and Spears, 1945); school administrators (Hanson and Umstattd, 1938); parents (Smith, 1953); pupils (Biber and Lewis, 1949; Bird, 1917; Book, 1905; Brookover, 1943; Cobb, 1952; Davies, 1933; Dallolio, 1955; Johnson, 1958; Livingood, 1935; Tiedeman, 1942; and Witroyal, 1950), and members of the public or community at large (Haer, 1953; Koopman, 1946; and Terrien, 1953). In addition, many studies have compared role conceptions for the teacher held by various subject groups. For instance, Jenkins and Lippitt (1951) studied teachers, pupils, and parents; Bible and McComas (1963) compared teachers and their principals; Biddle, Rosencranz, and Rankin (1961; see also Biddle, Rozencranz, Tomich, and Twyman, 1966; Biddle, Twyman, and Rankin, 1962; Green and Biddle, 1964; and Twyman and Biddle, 1963) investigated teachers, parents, pupils, school administrators, school board members, and students of education, and so on. Evidently, interest has centered on the conceptions of a large number of different subject groups who are presumed to hold conceptions for the public school teacher.

(Terminal) object persons. Although the vast majority of studies reviewed have asked subjects to report conceptions for the role of the public school teacher in general, a few studies reviewed ask for roles held for more restricted teacher positions. These have included elementary school teachers (Biber and Lewis, 1949) junior high school teachers (Keighin, 1948; Tiedeman, 1942), senior high school teachers (Dallalio, 1955; Livingood, 1935), men teachers (Rogers, 1953), women teachers (Lichliter, 1946), teachers identified by subject matter specialization (Brenner, et al, 1964), university instructors (Clinton, 1930; Haggard, 1943; Lamson, 1942; MacDonald, 1931; Robbins, 1944), and Air Force instructors (Getzels and Guba, 1954).

Generally, conceptions measured were assigned to an object position, although in a few studies the investigator also asked teacher-subjects to report (i.e., give anticipations for) their own behavior as individual object persons (Bible and McComas, 1963; Biddle, Rosencranz, and Rankin, 1961; Dunkin, 1966).

Sentient object persons. Where studies made use of extended transitors, a wide variety of sentient object positions appeared including those of the community, school administrators, school board members, other teachers, parents, pupils, and the generalized other. For the most part, again, sentient object persons were identified through positional designation rather than as individuals.

Reference modalities. The vast majority of studies involving simple transitors for the role of the teacher were normative in orientation; that is, subjects were asked to report what they felt teachers ought or ought not to do. Similarly, the majority of extended transitors involved the normative mode in their terminal transitors -- subjects were asked to estimate the norms of others. However, a sizeable minority of studies used anticipatory questions calling for the subject to estimate or to estimate others' estimates of teacher behavior. A few studies compared either anticipations and norms or the conceptions held by subjects of a given modality with those attributed to others. Biddle and his associates not only required subjects to give their own norms and anticipations, and to attribute norms and anticipations to various others, but teacher respondents were asked to anticipate their own behaviors as individuals.[1] Few, if any, studies appeared in which the modality of the lead transitor in a sequence was other than anticipatory; that is, where subjects were asked (for instance) to approve or disapprove the conceptions presumably held by others.

Reference characteristics. Almost every conceivable characteristic of teachers has been studied as referenced in role conceptions including teacher features (Greenhoe, 1940), traits (Lamson, 1942; McGill, 1931), backgrounds entered (Biddle, Rosencranz and Rankin, 1961), and -- above all -- performances. Interestingly, some of the most obvious characteristics of the teacher population -- for instance, its overwhelming domination by women -- have not often been studied. Biddle, Rosencranz, and Rankin (1961), intrigued with this phenomenon, attempted with three different instruments to "force" respondents to volunteer information about the female-domination of the teaching profession -- with no success. Apparently, there are some things that are "too obvious" to think about.

Reference contexts. The majority of reported studies of teacher role conceptions did not make specific use of contextual clues except those that were provided incidentally in wording a

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given question in the research instrument. In general, teacher performances (and other characteristics) dealt with were abstracted apart from context. However, it should be noted that many of the performances discussed refer to behaviors that can only be carried out in non-classroom contexts. For instance, a number of studies have dealt with teacher role performances "in the community," with teacher responsibility for non-school activities, or with moral standards held for teachers in non-school contexts. Those studies in which context has been specified have almost always used a physical location (primarily the classroom) in which to embed the teacher. Similarly, although the majority of teacher behaviors referenced are given in abstract terms, teachers are most often viewed as interacting with pupils, next with school administrators (primarily the principal), and finally with parents.

Reference content. Studies of role conceptions held for the teacher have covered a considerably wider gamut than studies of teacher classroom behavior, which is not at all surprising when one considers that role conceptions may deal with out-of-classroom or out-of-school teacher performances. In general, conceptual studies may be broken into two groups, those which attempted to cover a specific, defined set of functions performed by the teacher, and those whose items reflected molecular interests with no specific theoretical coverage.

A selection of studies illustrating attempts at functional coverage is presented in Figure 3. If we compare this figure with

Figure 2 it will be noted that not only do studies of teacher role conceptions cover a wider range of teacher performances in terms of context, but also that a larger number of teacher functions vis-a-vis the pupil are conceptualized than have been studied by direct observation to date. Note also that the overwhelming concern of observational studies ("pupil centeredness" or "autocracy-democracy") is represented in Figure 3 by but a single reference (Brookover, 1943).

Functional coverage in Figure 3 has been generated by two different techniques. In the majority of studies the investigators have set out to cover functional areas decided to be important on _a priori_ grounds. For instance, Fishburn (1962, 1965) established a set of items reflecting six functions that originally were stated to characterize the role of the teacher by Lucien B. Kinney and later the California Teachers Association (1952). Whether these six functions -- (1) direction of learning, (2) counseling and guidance, (3) mediating culture, (4) being a member of the school community, (5) liaising between school and community, and (6) being a member of a profession -- represent the totality of teacher functions is not at issue; the investigator assumes that they represent a previously-conceptualized universe and proceeds to design instruments to measure them. A somewhat different approach is represented in Sorenson, Husek, and Yu (1963) in which the authors (although originally possessed of a set of functional categories that provided guidance in setting up items) established their final

Role Functions	Fishburn (1962, 1965)	Soles (1964)	Bible and McComas (1963)	Columbotos (1962)	Getzels and Guba (1954)	Bidwell (1955)	Sorenson, Husek and Yu (1963)	Brookover (1943)
Professional	X	X	X	X	X	X		
Institutional		X	X			X		
Citizen	X		X		X			
Socio-Economic					X			
Liaison with Community	X							
Vis-a-vis Pupils								
Counselor	X	X					X	
Group Developer		X						
Director of Learning	X	X	X				X	
Mediator of Culture	X	X	X	X				
Motivator							X	
Referrer							X	
Disciplinarian							X	
Democratic vs. Autocratic								X

Figure 3. Fields of coverage in selected studies of conceptions held for teacher role performances.

set of teacher functions through factor analysis of responses.

The remaining studies cover a remarkable gamut of reference contents with very little attempt to establish the logic of field coverage. For instance, in the classic Commonwealth Teacher-Training Study (Charters and Waples, 1929) thousands of items were simply tabulated as reported by teacher respondents. Again, to illustrate the magnitude of coverage attempted, a selection of items used in two different studies has been set forth below.

Lamson (1942)	Champlin (1931)
Knowledge of subject matter	Thorough knowledge of subject matter
Personality to put course across	Interesting presentation of subject matter
Fairness or impartiality	Interest in the profession
Ability or skill in teaching or organizing subject matter	Enthusiasm for work
Ability to get along with students	Understanding human nature Pleasing personality
Sincerity and honesty	Alertness and broad interests
Sense of humor	Good speaking ability
Appearance	Good character and reputation

A variant of this latter approach is provided by Biddle, Rosencranz, and Rankin (1961) in which the authors attempted to select items that had high saliency for pre-test respondents and then to make functional classifications of their contents in terms of patterns of results. Whether this approach leads to the same "functions" as those generated by an analytic analysis of the teacher role is questionable; it certainly leads to more limited coverage.

Methods of investigation. A variety of methodological approaches are represented in the studies of teacher role conceptions. For one, most studies reviewed have assumed that respondents were capable of conceptualizing and responding veridically to items involving the direct and simple measurement of role conceptions -- usually using some form of Likkert scale in which a teacher characteristic was to be assessed against a scale of approval (for norms) or subjective probability (for anticipations). In a variant of this approach, subjects were asked to pick a "most approved" or "most likely" characteristic alternative from among a set presented.

In contrast to this "direct" approach, some investigators have assumed that:

> ... knowledge of the individual's role expectations cannot be obtained by the simple expedient of asking him about his criteria, as he is probably unaware of some of the most crucial factors. He is unable to state precisely the determinants of his judgment ... (Sorenson, Husek, and Yu, 1963).

Such investigators (including Fishburn, 1963, 1965; and Dunkin, 1966) have constructed scales for the measurement of centrally important role conceptions using Guttman or other assumptions.

Among studies that have measured role conceptions directly, various means have been used for item selection. Some studies report the direct measurement of role conceptions from information volunteered by respondents (Biddle, Rosencranz, and Rankin, 1961), others constructed items by interviewing selected subjects, other sets of items were chosen through examination of life histories, a survey of the literature, or functional theories; and still others through estimated likelihood of community control over teacher behavior.

Summary. Considerable literature has now appeared reporting studies of conceptions held for the role of the teacher, although there are few, if any, such studies in which role conceptions are validated against observations of actual teacher behavior. Such studies have taken data from a wide range of subject persons including both teachers and others connected with schools, have generally (although not exclusively) focussed on the entire teacher object position, and have included both studies of subjects' own conceptions and conceptions attributed by subjects to others in various modalities. Almost all conceivable characteristics of teachers have been referenced in these studies, and the majority of characteristics referenced have been abstracted from context except possibly for the classroom. Reference content has been similarly wide-spread; studies in which performances are referenced have appeared to fall into two groups: (a) those which make some attempt at field coverage defined in terms of general, functional categories for teacher role, and (b) those that present simply a list of miscellaneous categories. In general, however, coverage has been wider and less bound by ideological commitment than was the case in studies where teachers' behavior was observed. Finally, the majority of studies have attempted a direct measurement of role conceptions, although a few studies are now reported in which complex, indirect methods have been developed for the purpose.

Propositions Relating Teacher-held Role

Conceptions and Behavior

To seek to predict the performance of teachers (in the classroom or elsewhere) requires the investigator to examine many potential "causes." Conceptions held by the teacher for his role must constitute one such case, but so must the immediate demands and exigencies of the situation in which the teacher finds himself, the problems created by others with whom the teacher is in interaction, demands placed upon the teacher from the surrounding school system and community, and other forms of intrusion from the teacher's personality. In short, it would be surprising to discover that teacher-held role conceptions predicted to other than a fraction of actual performance variance. Similarly, role conceptions held by the teacher are bound to reflect additional determinants beyond those of simple behavioral observation.

In general, the problem of complex interactions between teacher-held conceptions, teacher performances, and other determinants is too complex to be solved here -- and we lack basic empirical information for the task. Instead, propositions will be confined here to the relative efficiency of various conceptual forms for predicting teacher behavior.

In arguing these propositions about the relationships between conceptions and behavior we shall be concerned not only with basic observations about the nature of the conceptualization process but also with stable characteristics of the teacher's professional life.

Structural Properties of the Teaching Condition

As operated in America (and to a lesser extent in other Western societies) educational institutions present a predictable set of structural properties within which the teacher is placed. Schools are set up by public or private groups in order to teach the young. Although "teaching" is often a subject of controversy, generally it involves the transmission of minimal societal standards for behavior (*i.e.*, socialization); it may also involve the inculcation of attitudes, the learning of specific -- vocational or avocational -- skills, the utilizations of certain facilities, and such mundane tasks as baby-sitting service. However defined, teachers are given the task of teaching, and children the task of learning; both are required (by law) to participate in these tasks; and for predictable portions of the day, week, and year both are jointly incarcerated into classrooms for this purpose. The classroom itself consists of a set of physical equipments in an enclosed space, generally a box-like structure with desks, chairs, blackboards, and other educational paraphanalia. It is laid within a school having other predictable behavioral settings, such as the halls or corridors, athletic fields, playgrounds, administrative offices, and the like. The school also exhibits a predictable cast of characters with whom the teacher is required to maintain relationships including the principal, the school superintendent, the school board, the parents, and (nebulously), the "community." However, for the most part the teacher's relationships with these others is on an occasional and formal basis. His primary interactions are with a group of immature pupils with whom he is closeted for several hours a day, and for whom he is responsible for teaching.

From the viewpoint of this paper there are two implications of the teaching condition that bear directly upon the problem of predicting conception-behavior relationships in the teacher. In the first place, it should be observed that most of the teacher's behavior is played out with relatively non-powerful target and audience persons. In the small discussion group, for instance, normally the actors are approximately equal in their ability to use the immediate sanctioning strategies of praise or disapproval to control one another's behavior. This is simply not the case in the classroom. Although a teacher may, indeed, be sensitive to the reactions of pupils to his teaching, this is not required of him. Pupils have only a vague and tenuous hold over their teachers, a hold based on the teacher's conscience or teaching philosophy, or upon the distant principal, parent, or law applying to education. Only in the post-pubertarian, secondary school classroom is the teacher in serious "danger" of sanctions from the pupil, and the wise teacher avoids even these latter through setting up norms that strictly control pupil activities.

The second structural property of teaching is its isolation. Not only are teachers but infrequently viewed by principals, parents, and other adults concerned with education, but teachers almost never have an opportunity to observe one another in action. As a result, teachers can have only vague ideas as to how they -- in fact -- compare in their techniques with other teachers.

These two factors, isolation from immediate feedback and the observation of other teachers, suggest that teachers are uniquely dependent on their own conceptual processes for determining behavior. Whereas it is often possible to adjust to behavior of the pedestrian or factory worker through coersion or persuasion at the time, teachers' behavior is normally set through courses in education and can be changed only through adjustments made in the teacher's personality. Although the principal may in fact have considerable means of control over the teacher, he often finds it difficult to adjust teachers' behavior in other than superficial senses. At the same time, teachers are often unaware of their relative standing with regard to other teachers on important dimensions of teaching. Although they are most certainly aware of general pressures stemming from the school administration (emphasis upon, for instance, "discipline," "cleanliness," or "growth and development"), they often find it difficult to appreciate their own standing on these issues compared with other teachers or to know how to integrate in their own classroom behavior a change in policy. Teachers are probably unique among all, common occupational groups in Western society in this odd combination of circumstances: isolation from immediate feedback, and inability to observe others who are members of their profession. These structural concommitants of the teacher's position have various ramifications as suggested below.

Object-person Abstraction and Teacher Behavior

The first question I shall consider systematically is the relationship between level of abstraction used for object person in teacher-held role conceptions and teacher behavior. To state the issue in question form, does it make a difference in teacher behavior whether the teacher holds a conception for himself, for some sub-group of the teacher position, or for teachers as a whole?

To answer this question we must appreciate the reason for the holding of conceptions that are generalized to positional categories. In the small, isolated society or in the primary group the individual need hold no such generalized conceptions; it is sufficient to maintain norms and anticipations for individuals, since each individual is known as a person. However, when people interact with large segments of the community, it is impractical to maintain differentiated conceptions for the behavior of each individual; too many distinctive conceptions would be necessary. Instead, positional classifications into which others fall are used to organize the conceptual structure, and conceptualizations are held for the position as an abstracted whole. The fact that in the real world members of the position may not conform exactly to the norm or anticipation held does not detract from the utility of the generalized conception. It is often sufficient for the subject to know what the modal position member is likely to (or "should") do in order to plan intelligent behavior. Thus, generalized norms and anticipations are normally sufficient to plan activity (and predict subject behavior) when they are held for the position of the other.

This description is obviously not the case when we turn to conceptions maintained by the teacher for a position of which he, himself is a member. While anticipations of one's own behavior as an individual are likely to predict performance directly, the subject may maintain anticipations for "the rest" of his position that are different from those he maintains for himself.

> Hypothesis I -- Anticipations held by the teacher for his own behavior as an individual will predict his performance more accurately than anticipations held by the teacher for the teacher position.

This hypothesis may probably be generalized so as to reflect all degrees of positional abstraction in the object person: viz., anticipations for self will predict more accurately than anticipations for a sub-position of which the subject is a member, and predictions for the sub-position will be more accurate than predictions for the entire position, etc.

It is less clear whether level of abstraction in object person makes any difference when dealing with subject norms. On the one hand, norms should normally represent generalized standards for groups of persons and be no different when the subject is speaking of himself as when he is speaking of teachers in general. On the other hand, the individual subject may differentiate between "norms for others" versus "norms for me" (suggesting the norms for the self would make a better prediction), or norms held for the self may reflect some unattainable, wished-for-standard (suggesting that norms for the self would make a poorer prediction). Lacking further information about the nature of norms, we state no hypothesis.

Conceptual Modality and Teacher Behavior

The above paragraph differentiates between the anticipation and the norm as measures which predict to teacher behavior. Are there any systematic differences between conceptions in these differing modalities in their relationships with teacher performance?

Answering this question requires that we differentiate between the contrasting utilities of anticipations and norms for the subject. The anticipation is a neutrally-toned cognitive map, a statement or description of social reality as seen by the subject. As a reflector of performance, the anticipation provides a perceptual report; as a predictor of performance, the anticipation tells the subject what is likely to occur. Anticipations for one's position or oneself are reflections of the likelihood of performance -- given the contexts and issues specified. For instance, the subject may tell us, "Normally, I stop at traffic lights. But if it were the middle of the night with no other cars in sight, I would probably drive through."

Norms are a psychologically more sophisticated form of conception requiring the subject to hold ideas about what "should" and "should not" occur. Norms that are held for the behavior of others often lead the subject to sanction the other; that is, to mount pressures against others for conformity to norms held by the subject. However, when the subject reports norms for himself, he reports standards that are backed up only by the pangs of conscience. If sanctioning is done, it is strictly an internal matter. Following up the example given in the above paragraph, the same subject might also tell us, "Sure, I know it's bad to run the light, but who is hurt and who's to know under the circumstances?"

In the above example we have illustrated expediency on the part of a subject. The expedient subject will choose behavior in terms of its probable (externally based) consequences to himself rather than in terms of its intrinsic, moral values. Following Gross, Mason, and McEachern (1958), we shall discriminate here between expedient and moral subjects. Subjects who behave morally can be expected to follow a normative dictate regardless of the consequences. Our initial definition of morality will be in terms of the importance of the subject's own norm over other behavioral determinants. Below we expand this definition to include norms attributed to others. In the example of the previous paragraph, a moral subject would be expected to stop at the light regardless of the conditions in which the light were encountered.

Note now that the teacher in the classroom is in a similar state to the subject encountering a night-time traffic light; his actions are relatively unobserved by others who might mount sanctions against him. For the teacher, then, we make two predictions depending on his location along a moral-expediency axis.

Hypothesis II -- Anticipations held by the teacher for his behaviors will predict his performance more accurately than norms held by the teacher for his behavior if he is expedient, and less accurately than norms held by the teacher for his behavior if he is moral.[1]

Own Versus Attributed Conceptions and Teacher Behavior

Hypothesis II is stated so as to apply only to simple transitors; that is, only to transitors the subject holds himself. Does it also apply to transitors attributed by subjects to others, to extended transitors? As will be seen, the answer to this question depends upon whether we assume the subject to be expedient or moral in his orientation; and it is convenient to separate these two cases analytically.

Expedient subjects. To the extent that the behavior of expedient teachers is, in fact, visible -- and the teacher is subject to sanctions for non-conformity to others' norms -- it would have to be assumed that the teacher is more likely to conform to norms than anticipations attributed. However, this condition is not normally met in the classroom.

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[1] This hypothesis and several to follow are revised from Tomich (1963). Tomich stated several hypotheses assuming expediency on the part of the subjects and was unable to find general support for them. He was, however, able to break his subjects apart analytically into "congruent" and "non-congruent" populations -- "moral" and "expedient" groups in the present terms.

> **Hypothesis III** -- In classrooms and other contexts where teacher behavior is obscured, expedient teachers will be equally unlikely to conform in their behavior to either norms or anticipations attributed to others; in teachers' lounges and other contexts where teacher behavior is observed, expedient teachers will be more likely to conform in their behavior to norms attributed to others than to anticipations so attributed.

A similar hypothesis may also be stated for relationships between the expedient teacher's own conceptions and those he attributes.

> **Hypothesis IV** -- In classrooms and other contexts where teacher behavior is obscured, expedient teachers will be more likely to conform in their behavior to their own norms than to those attributed to others; in teachers' lounges and other contexts where teacher behavior is observed, expedient teachers will be more likely to conform in their behavior to the norms

> likely to conform in their behavior to the norms they attributed to others rather than to their own norms.

This leaves but one type of conceptual comparison unspecified for expedient teachers -- that between discrepant anticipations. As we shall see below, no prediction can be made for this comparison until we know more about the object person(s) involved.

Moral subjects. In order to answer the question of relating own and attributed conceptions for the moral subject, assumptions must be made about the nature of expediency-morality. Gross, Mason, and McEachern (1958) originally identified morality as the tendency of subjects to assign legitimacy to norms attributed by subjects to others. In other words, morality was judged if a subject said, "The other has a right to hold this norm for me, and I shall follow it regardless of the consequences." A similar usuage is followed in Raven and French (1959) in which the investigators present evidence to suggest that subjects conform in private to pressures placed upon them by legitimate others. I shall assume here that the tendency to conform to legitimate norms-for-their-own-sake is a general one, that moral subjects not only conform behaviorally, but also that they tend to adjust their own norms to the legitimate norms of others and choose others' norms over their own in a pinch.[2]

Hypothesis V -- Moral teachers will show fewer disparities between their own norms and the norms they attribute to others seen as having the right to hold norms for them than will expedient teachers.

Hypothesis VI -- Regardless of context, moral teachers will be more likely to conform to legitimate norms attributed to others than they are to conform to anticipations attributed to those others; regardless of context, moral teachers will be equally unlikely to conform to non-legitimate norms or anticipations attributed to others.

Hypothesis VII -- Regardless of context, moral teachers will be more likely to conform to legitimate norms attributed to others than they are to conform to norms they hold themselves; regardless of context, moral teachers will be more likely to conform to their own norms than to non-legitimate norms attributed to others.

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[2] This assumption makes the dimension of expediency-morality a stable personality characteristic of the teacher. It is possible that legitimacy may also depend on item content and context thus forcing a rewording of Hypothesis II through VI, VIII, and IX. However, data from both Gross, Mason, and McEachern and Tomich suggest a stable, personality trait. It should also be observed that the expediency-morality dimension probably represents but one of a series of useful distinctions to be found in a general theory of self-sanctioning.

Expert power and discrepant anticipations. We turn now to the problem of relating own and attributed anticipations to teacher behavior. French and Raven (1959) have suggested that there are several sources of power, among them the ability to sanction, legitimacy, and expertise. "Expert power" is based on presumptions made by the subject that the object person knows about the subject at hand -- even if the subject "does not." If expert power affects the teacher, we can state the following hypothesis.

Hypothesis VIII -- Given a discrepancy between anticipations held by the teacher and those attributed by him to another, the teacher will be more likely to conform to the anticipations attributed if the other is seen as an "expert," and more likely to conform to his own anticipations if the other is seen as lacking "expertise."

Hypothesis VIII is presumed to hold regardless of whether the subject is expedient or moral and without regard to the context in which teacher performance is played out.

Object Person Characteristics and Teacher Behavior

We have already dealt with several object person characteristics in the above section, the characteristics of sanctioning, power, legitimacy, and expertise. Without further preamble, these characteristics may be used to generate a series of hypotheses parallel to those discriminating own from attributed conceptions. In the Hypotheses stated below IX stems from IV, X follows VII, and XI reflects VIII.

Hypothesis IX -- In classrooms and other contexts where teacher behavior is obscured, expedient teachers will be equally likely to conform to discrepant norms attributed to a powerful and a weak other; in teachers' lounges and other contexts where teacher behavior is observed, expedient teachers will be more likely to conform to norms attributed to a powerful than to a weak other.

Hypothesis X -- Regardless of context, moral teachers will be more likely to conform to legitimate norms attributed than to non-legitimate norms attributed to others.

Hypothesis XI -- Given a discrepancy between anticipations attributed to others, teachers will be more likely to conform to the anticipations attributed to expert than to non-expert others.

It is also possible of course that other object person characteristics will affect subject response. Subjects may discriminate among object persons or positions in terms of personal liking, emotional involvement, feelings of empathy or sympathy, awareness of problems the other faces, and the like. Systematic treatment of these conditions would appear to be beyond the scope of this paper.

Reference Characteristics, Contextual Specification, and Teacher Behavior

Apart from the factor of context observability dealt with above, teacher-held role conceptions differ from one another in terms of the teacher-characteristics they deal with and in terms of their contextual specifications. There is obviously a relationship between these two factors, although the relationship is far from complete. Teacher features, background experiences, and behavioral traits are normally presumed to be context-general, while conceptions held for the specifics of teacher behavior are normally bounded by setting, situation, target or audience person, or functional context. We would expect, therefore, to find conceptions to have greater detail and less stereotypic distortion with increasing contextual specification. This suggests the following hypothesis.

> Hypothesis XII -- The greater the contextual specification, the more conformity will be observed between teacher-held role conceptions and teacher performance.

Hypothesis XII states not only that teacher performance will show less variability in a specific context but also that conceptions stated for that context will be "closer to the mark" than conceptions stated for broader contexts. Clearly, this hypothesis is not presumed to hold for teacher background experiences, features, or other non-variable teacher characteristics. Another way of stating Hypothesis XII is to suggest that "stereotypy" is more likely when contextual clues are minimal.

Reference Abstraction and Teacher Behavior

A similar argument will be advanced for the level of abstraction involved in conceptualizing teacher performance. There are many reasons why a high-level abstraction for behavior may be a poor predictor of behavior; the abstraction may not be one of the subject often uses, higher level abstractions are more subject to distortion and are less likely to be checked through observations because of their diffuse character, and it is difficult to conform to an abstract specification for behavior since one lacks information about its applicability in any given situation. Hence, the following hypothesis may be stated.

> Hypothesis XIII -- The higher the level of abstraction in terms of which teacher behavior is characterized, the less conformity will be observed between teacher-held role conceptions and teacher performance.

There are two ways in which the difficulties suggested by Hypothesis XIII may be avoided. It is possible to conceive of some norms or anticipations as "central" personality characteristics. Thus, some norms, although abstract, may reflect basic values or motives in terms of which many fields of teacher behavior are organized. Examples of this assumption have already been presented in the work of McGee (1955), Ryans (1960), and Dunkin (1966). Referring to the last-cited reference, Dunkin assumes not only that teachers attribute norms about "warmth" and "directiveness" but that these same dimensions are reflected in value structure, and so on. Such assumptions are tenable if backed up by empirical data, but it should be pointed out that: (1) most role investigators have assumed a greater utility for the measurement of contextually-differentiated role conceptions, and (2) it is unclear at this writing whether the "factor structure" of conceptions and norms represents the same dimensions as do factor structures of traits or motives.

The second way in which the problems of Hypothesis XIII may be overcome is to use abstractions that are volunteered by teacher-actors themselves. Regardless of level of abstraction, if the teacher volunteers a given concept in describing teacher (or his own) behavior, a major basis for Hypothesis XIII is cast in doubt. Needless to say, conceptions volunteered in the "testing situation" are less viable than conceptions revealed by the teacher in performance transitors. The only difficulty is that teachers do not often speak of their own role during the classroom lesson -- rather their discourse usually consists of transitors referencing pupils or out-of-classroom events. Whether the teacher conceptualizes low-level descriptions of his transitive behaviors that reference others is not yet clear; but it certainly seems a better bet to work at this level rather than at the level of high abstractions which may or may not appear in the working vocabulary of teacher-held conceptions.

Anchored Versus Unachored Measurement and Teacher Behavior

The above observations are closely tied to a major methodological issue in the measurement of teacher role conceptions. Let us assume with Jackson (1960) and Biddle (1961) that a norm or an anticipation may be represented fully as a distributional function. (Norms consist of a distribution of approvals or disapprovals given to a set of behavioral alternatives; anticipations exhibit distributions of subjective probability.) Two basic ways have appeared in the literature in which the distributional form of a conception may be approximated. In the first technique the subject is asked to provide an approval (or subjective probability) rating for a stated teacher performance, the investigator making the unstated assumption that all other behavioral alternatives are grouped together. Such a technique (or Likkert scale) provides the investigator with a maximum of opportunities for comparing conceptions held by several persons or conceptions held and attributed. In the second technique the subject is called upon to slelect from a series of performance alternatives that which is most approved (or least approved, or most likely, or least likely). Provided that performance alternatives may be presumed to fall in a natural order, information from this second technique may also be used to compare norms or anticipations from subject to subject. But often no such assumption is viable, in which case the investigator is left with the unpleasant task of investigating the underlying dimensionality of the performance alternatives offered or of constructing an abstract performance dimension through Guttman-type assembly of items.

Despite the difficulties of the latter technique, it has distinct advantages as a method of measuring conceptions for the teacher. Since subject-teachers do not normally observe other members of their position, anchorages for scales of subjective probability and approval are bound to be vague and idiosyncratic. To illustrate, let us consider the teacher who assumes (in error) that most teachers smoke a great deal. Should we then ask him to rate his own smoking behavior he may report that he smokes "very little" since his standard of comparison is that of the anticipation he erroneously attributes to others whereas in fact we might observe him smoking a more-than-average amount. In contrast, should we ask the same teacher to anchor his anticipation -- to tell us how many cigarettes he smokes a day for instance -- his report is likely to be more accurate since the standard for his judgment is a performance alternative which is encountered in his daily experience. Similar arguments may be advanced for anchoring the measurement of norms or of attributed conceptions. This suggests the following hypothesis.

Hypothesis XIV -- Teacher performances are more likely to conform to role conceptions held by the teacher that are measured with anchored techniques.

Note that Hypothesis XIV is less likely to hold for other occupational positions, where the subject has a greater opportunity to observe others in action.

Summary

Fourteen hypotheses have been presented relating to conformity between teacher-held role conceptions and teacher performance. These hypothesis cover the determinants of: level of object-person abstraction; conceptual modality; own versus attributed conceptions; expediency-morality as a personality dimension of subjects; power, legitimacy, and expertise as dimensions of the object person; contextual specification; level of reference abstraction; and anchored versus unanchored measuring techniques. The major implication of these hypotheses is that while teacher-held role conceptions may predict teacher performances (and vice versa) the prediction is neither a simple one, nor should we expect a one-to-one relationship.

Conclusion

Role theory holds enormous promise for the study of education.

With role concepts one can describe the positional structure of the educational institution, the formal and informal rules governing conduct in educational settings, the tasks educators are called upon to solve, the role conceptions held by individuals who participate in education, and the behaviors of educators. That this promise has been widely recognized is clear from the large number of studies of education that have now appeared in the role mode.

Similarly, there can be little doubt but that teacher-held role conceptions are a major determinant of teacher behavior. Not only is this proposition suggested by role theory, but a major tenant of most teacher-education curricula is that through inculcating an appropriate conceptual framework, youthful teachers can be prepared to carry on the vital work of education.

Moreover, the literature reports literally hundreds of studies wherein the norms and anticipations held for teachers (by teachers and others) are eximined, compared, related, and interpreted. Similarly, there also exists today a sizeable literature in which the classroom performances of teachers are measured and investigated. And yet -- surprisingly -- no study has yet appeared to the author's knowledge in which both the conceptions of the teacher have been measured and the performance of the teacher has been observed. As a result, we are left in the dark both with respect to the relationships between various forms of teacher role conceptions and teacher performances, and with regard to the interaction between these factors and other determinants of performance and conceptualization.

To state hypotheses about the conception-performance relationship as is done here is but one step in the research process. The next step is to test those hypotheses by measuring the conceptions and observing the behaviors of real teachers in actual classroom situations. If done properly, such a study would also begin to provide basic information about these aspects of teacher behavior that are predictable from environmental influences and other teacher personality characteristics, thus enabling us to see the conception-performance relationship in its proper context.

Only through such research can the promise of role theory be actualized in the educational setting; only with such a fire can be forged an empirically based educational philosophy.

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CHAPTER VIII

ON THE LEARNING OF NORMS IN THE CLASSROOM

Richard Videbeck

Orderliness in the classroom is an ideal held by teachers, administrators, and parents alike. The absence of disturbing incidents permits teachers and pupils to focus upon the principal learning task and enjoy a congenial atmosphere. At a sociological level of interpretation, orderly behavior is seen as a consequence of shared opinions and the operation of group pressures. This approach to the problem tends to be relatively unsatisfactory because there is lack of a clear operational differentiation of the variables that are being treated, namely, group pressures, conforming behavior, and shared opinions. The more behavioristic interpretation, while failing to incorporate the reality of sociological variables does afford a more developmental view. At the behavioristic level of description, orderly classroom behavior can be thought of as highly predictable patterns of teacher and pupil behavior. For every type of stimulating circumstance, there is a predictable type of response.

Orderly behavior in the classroom, from this latter point of view, can be explained in terms of the conditions which affect learning simple stimulus-response contingencies. The simplest explanatory principle about establishing rudimentary stimulus-response actions required only one additional and readily observable factor, namely a reinforcer. A reinforcer is any event which, given a particular stimulating event-response sequence, increases the probability that the response will occur whenever that stimulus occurs again. While reinforcers need not be interpreted as utilities, we shall find it useful to consider only those reinforcers which can be interpreted as utilities for the responding individual.

At the risk of over-generalizing, a few general principles of reinforcement can be stated. The rate with which a criterion response is acquired varies directly with: (a) the number of times the response is followed by a reinforcing event and preceded by a given stimulus; (b) the proportion and regularity of occurrence of the stimulus-response sequence which is followed by a reinforcing event; (c) the shorter the time interval between the response and the reinforcement; and (d) the "threateningness" of the reinforcing event which follows the stimulus-response sequence. Interestingly enough once a criterion response is acquired, that is, its optimum probability of occurrence has been attained, the maintenance of the response's probability is dependent upon the same condition as those which lead to its acquisition. Thus, we can predict the rate at which an acquired response will be extinguished if we know the conditions under which it has been acquired.

Although the evidence upon which these generalizations are based relates to relatively simple motor responses, a little poetic license and fantasy yields some interesting projections of these principles into the realm of classroom behavior. Instead of talking about relatively discreet motor responses, we shall focus upon a somewhat more molar type of response. Corresponding to the number of times that a response is followed by a reinforcing event, which is generalization (a) above, we can state that the teacher's schedule of emitting positive and negative evaluations and reactions to a child's behavior will predict to the rate at which the child's acquisition of the response or acquiring an avoidance for the response takes place. Similarly we can observe the teacher's schedule of reinforcement and insert this in place of generalization (b) in the preceding paragraph. In a similar vein the (c) and (d) generalizations can be seen as having their counterpart in the classroom situation.

Consider two extremely different classrooms! In one the teacher asks questions and the pupils answer. The teacher commands and the pupils obey. Each and every noble and virtuous response is amply and quickly commended and rewarded. All instances of deviation and irrelevance and every indication of ignorance immediately releases darts to arouse shame or pain. Although things seem to be well in hand the teacher is trapped, if the principles of reinforcement can be translated to human affairs. The teacher cannot for but a moment glance away from the pupils -- to write on the blackboard or look at her grade book or even to blow her nose. She must constantly scan the classroom horizon for both good and ill (particularly ill), so that none will escape its certain and appointed treatment. If she fails, the probabilities of the established criterion responses, that is orderly behavior, are likely to decline, which is just another way of predicting pandemonium. So she must start all over again.

In the other hypothetical classroom, less patterned and more random behavior can be observed. The teacher commands and the pupils obey, some reticently, others immediately. Correct answers may be commended; wrong answers will certainly be corrected and perhaps criticized. Non-compliance may be punished or may be chided or may be questioned. Obedience may arouse a smile from the teacher or she may take it for granted. Now according to the principles enumerated above, this teacher could leave the classroom for a period of time without affecting the probabilities with which criterion responses occur. It may have taken her longer to achieve the fairly orderly, patterned behavior or condition in her room, but she can also feel more secure that it will persist longer.

Why should we be concerned about response, or stimulus, or reinforcer generalization? What is the basic question that we are addressing ourselves to in this paper? What we seek to understand is how orderly behavior is generated in the classroom. The central thesis underlying the model which will be developed in the following pages is as follows: Teachers enter a classroom with a more or less clear conception of desired outcomes and the strategies for attaining those outcomes. These are her outcomes and her strategies. Pupils also enter the classroom with their own preferences which can be interpreted as their goals or their needs. Operationally the pupils' preferences can be seen also as preferred activities. The desires of the teacher and of the pupil can reasonably be assumed to be in less than complete agreement. What we are concerned with in this model is an examination of the effects of various teacher strategies for inducing pupils to behave in a manner that is in accord with the teacher's preferences. The induction of pupil conformity to teacher norms will be seen as entailing some measure of stimulus, response, and/or reinforcer generalization.

To approach the issue of patterned classroom behavior in terms of the stimulus-response-reinforcement sequence leads to a description of the manifest correlates of stable and unstable responses. Although this may provide suggestions for strategy of teacher behavior, it does not account for some aspects of orderly behavior which are of particular significance for the understanding of how norms are acquired. It does not offer an adequate account of either stimulus or response or reinforcement generalization. The available empirical evidence does suggest that generalization via contiguity does occur, and at least stimulus generalization is achieved most readily with positive reinforcement supplied on an infrequent and random schedule. A significant proportion of generalization occurring in human affairs is not based upon a manifest condition of contiguity among stimuli and responses or reinforcers which can be only unambiguously operationalized. Rather, much human behavior is verbal and implicit, and hence, in order to understand generalization in human behavioral phenomena we must investigate the semantic, cognitive, and functional equivalences among stimuli, among responses, and among reinforcers.

Introducing the requirement that our analytic scheme must handle functional equivalences forces us to deal with hypothetical constructs and thus makes inferences about what transpires between the presentation of the stimulating circumstances and the occurrence of the responses. In part we shall have need to make some inferences about the motivational states of the organism as well as inferences about some of the cognitive processes by which incoming information is processed.

In the remaining sections of this paper we shall develop a model of norm learning. In the section following we shall see that the notion of norm learning is a misnomer. Norms, as we shall come to use the term, are conclusions of an argument and as such cannot be learned; rather the premises upon which the argument is based can be learned. In the final sections of the paper a description is presented of the major and minor premises of this argument.

What is a Norm

Like many other terms in social psychological analysis "norm" has not been used consistently nor with precision.[1]

However, it is possible to list several meanings often associated with the word. Perhaps the basic phenomenon that provokes the word is the observable regularity of social behavior in recurrent social situations. Few would go so far as to identify norm with the modal behavior in a situation -- the descriptive statistical approach -- though Levy does say that norms are observable "uniformities" in behavior (1952, p. 114); an operational norm is at times identified with modal behavior, as in Sherif and Sherif (1956, Ch. 8).

More often, norm is not a behavioral concept, but something presumed to stand behind behavior: a "standard" or a "blueprint" for behavior.

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[1] The following analysis is taken from the introduction section of Hays and Videbeck (1963).

In Festinger, Schachter, and Back (1950), for instance, a group norm is a hypothetical construct that is not itself observable but related to the empirical realm via a set of propositions concerning cohesiveness and communication. One also finds norm being spoken of as a psychological unit (which may of course have social origins). A norm is an "idea" (Homans, 1950, p. 123), a "concept" (Sherif and Sherif, 1956, p. 170), a "cognition" (Biddle, 1961, p. 12). Or, a norm is one sort of basic unit of culture, a shared action-oriented symbol (Parsons and Shills, 1951, p. 106).

But norm is not just any cognition or symbol. Almost always it involves an evaluative dimension, in some sense or another. Sometimes there are connotations or prescriptiveness, of moral obligation, or "oughtness." These connotations are perhaps the most widespread and traditional ones among sociologists. For others the primary connotations of norm are not "oughtness," with its moral flavor, but "approval" (Jackson, 1960). Biddle, Rosencranz, and Rankin, for instance, assessed "norms" with statements such as, "What do you like teachers to do?"(1961).

Both those persons who have used norms with the connotation of oughtness and those who have used it with the connotation of approval have traditionally associated norms with sanctions -- punishment following breaking a norm, or reward following behavior in conformity to the norm. In this view it is not the behaviors for which the norms exist, but certain outcomes of such behaviors that are crucial in developing and maintaining the norms, and in regulating social behavior. The reward and punishment may be directed by other people toward the focal person, or may be merely anticipated, or may be in the way of self-reward or self-punishment. Even in treatments that do not emphasize sanctions, the role of outcomes may be inferred. Festinger, Schachter, and Back (1950), for example, make much of cohesiveness, which involves such potentially rewarding phenomena as interpersonal attraction, need gratification, and prestige associated with group membership.

The conceptualization of "norm" as developed here is similar to some of the notions outlined above, perhaps distinctly in its emphasis upon outcomes, which we interpret more widely than just sanctioning outcomes. A norm is a cognitive unit, but not simply a set of behavior-representations mapped into a single evaluative dimension, as with Biddle (1961). The evaluations involved are instead associated with the anticipated outcomes of taking some action; and also involved are the subjective probabilities that the outcome will occur if the action is taken. Given a set of psychologically possible outcomes associated with a certain behavioral alternative it will be obvious that we have the basic terms of the subjectively expected utility of the alternative, in the sense the term is used in behavioral decision theory (Edwards, 1954). To elaborate somewhat, it is suggested that norm may be profitably conceived as a cognitive unit that is central in choosing a specific course of action out of several possible courses of action in a given situation. A norm is a rule which guides both the selection of one's own behavior as well as guiding one's reaction to the behavior of others. It is a rule for both action and reaction.

As a rule of action, that is a rule for selecting among alternatives in choosing one's own behavior, we can think of a norm as a conclusion of a syllogism. In this syllogism the individual is cognitively mapping the situation in which he is or will be responding. To illustrate, consider the following situation: the teacher has just said, "Don't talk," and at the same time the teacher is frowning. Previously the individual has observed that whenever the teacher says, "Don't talk" and frowns at the same time she will scold anyone who does talk. The person whose preference for talking is considerably less than his preference for being scolded will tend to draw the conclusion that he must not talk. On the other hand, the individual for whom the preference for talking is equal to or greater than his preference for not being scolded is not likely to draw such a conclusion.

Obviously this syllogistic process need not occur at the level of awareness nor may the person be able to verbalize it is he is somehow aware of it. It should be understood that the syllogism is used principally as a heuristic vehicle for stating and exploring the behavioral, cognitive, and motivational dimensions upon which any normative concept rests. It removes norms from the class of ad hoc concepts. The principal advantage of the syllogistic model however lies in its potentiality for explaining the development and change of normative conclusions within a given individual.

In the above illustration there were two premises. The major premise was an informational one which both described the present situation and called forth from memory possible implications of this situation.

The second or minor premise involved a comparison of two or more utilities. In the above illustration one of the utilities is the person's own preference and the other lies in the potency of the teacher's behavior, however in other illustrations such potency may be exclusively internal or external to the individual. Later we shall introduce other factors which enter into the comparative process which we have described as the minor premise of the syllogism.

Return for a moment to an examination of what is contained in the major premise, that is, the informational premise. There are two sorts of information that need to be called upon. First there is information that derives from the present situation. In typical S-R terms, this is the stimulus. In addition there is information which is called up from memory which is a summary or resumé of past experiences. The information that is stored in memory may or may not be veridical and the chances are quite great that motivational factors will have intruded so as to distort the accuracy of recalled events. Let's look at a more systematic, stylized example of this syllogistic form in Illustration I.

Within this view of a norm, there is no sense in which we can say that a norm is learned, that is that conclusions are learned, except we imply that individuals learn to predicate conclusions upon premises and that they learn the constituents of these premises. "Norm learning" within the present view is a general rubric that subsumes the acquisition of discreet cognitive and preferential elements which when cast into syllogistic form yield a normative conclusion.

ILLUSTRATION I

MAJOR PREMISE:	**a) information from present stimulus**	**"The facts of the situation are such and such." (Facts include, persons, their behavior, their traits, the expression, as well as material features.)**
	b) information called up from memory	
	(1) alternative actions	**"Given the information about the present stimulus, I can do X and Y; i.e., X and Y are possible."**
	(2) possible outcomes	**"Given the information about alternatives open to me in this situation, and given what has happened before, doing X will lead to outcome p and doing Y will lead to outcome q."**
MINOR PREMISE:	**Comparison process**	**"Given the information in the major premise, and given my hierarchy of outcome preferences, I prefer p to q.**
CONCLUSION:	**The Norm**	**I must do X.**

For the time being we shall assume that the processes by which information from the present situation is taken in and stored in memory are constant over any population we choose to examine and yield veridical information. In other words, we shall ignore all possible distortions of situational information. This leaves alternative actions, possible outcomes, and the comparison process as the only features that we shall directly treat in our analysis of "norm learning."

A Model of Norm Learning: The Observables

The purpose in constructing any behavioral model is to provide a parsimonious account of a particular class of behavioral variance. Without exception, models fail to incorporate the fullness and richness of the actual behavior. The model that we present here is not different in this respect. Within this model there are but two observables: acts and persons.

For our discussion of acts we shall lean upon Roger Barker's descriptive system. It is acts in their temporal aspect with which we shall be primarily concerned. When I say temporal I refer to the sequencing of acts over time. As Barker (1963) has noted, this approach to behavior is poorly described and poorly understood. In recent years there has been some concern shown for sequential behavior streams, attacking the problem from several points of view. Miller and Frick (1949) employ statistical and information theoretic analyses to the problem of sequences of responses. Harris (1962) looks at the problem from the vantage point of linguistics. While each of these contributes to the understanding of some facet of sequential behavior, we shall look most closely at Barker's scheme.

> Innumerable parts of the behavior stream have been identified and described, encompassing such diverse phenomena as an alpha wave, a maze-learning trial, and a psychotic episode, a five-minute segment of behavior, a game of marbles, and an answer to a pollster's questions. The stream of behavior can be divided into an infinite number of parts. These countless parts of the behavior continuum are of two types so far as their origin along the time dimension is concerned. . . .
>
> One type, here called behavior units, consists of the inherent segments of the stream of behavior. The boundaries of behavioral units occur at those points of the behavior stream where changes occur independently of the operations of the investigator. Alpha waves, psychotic episodes, and games of marbles are behavior units. Behavior units enter psychology when investigators function as transducers, observing and recording behavior with techniques that do not influence its course. . . .
>
> The other parts of the behavior stream may be appropriately called behavior tesserae. Tesserae are the pieces of glass or marble used in mosaic work; they are created or selected by the mosaic maker to fulfill his artistic aims. Similarly behavior tesserae are fragments of behavior that are created or selected by the investigator in accordance with his scientific aims.

> Maze-learning trials, five-minute segments of behavior, and answers to pollsters' questions are behavior tesserae. They occur when there is a feedback between the investigator and the behavior stream. When an investigator directs a subject to "Define orange," "Tell me what you see on the card," "Judge which of these weights is the heavier," he destroys the natural units of the behavior stream and imposes behavior tesserae in their place. Behavior tesserae are produced by experiments, tests, questionnaires, and interviews, i.e., by all methods that require the subject to undertake actions at the behest of the investigator. (Barker, 1963, p. 1-2)

The only kind of behavior that we will treat in the present model is what Barker calls behavior units, that is the ongoing stream of acts which are not influenced by external agents. No investigator will intrude so as to destroy the natural units of the behavior stream. No investigator will impose behavioral tesserae in place of the units of the behavior stream. However, we will note that in any situation in which there is the exercise of power by one person over another, naturalistic behavior tesserae are generated. Consider the classroom situation in which children are holding a conversation among themselves, and then the teacher tells them to stop. Of course the teacher is a unit of the natural situation and her behavior must been seen as part of the stream. Yet from the standpoint of the child's behavior the teacher is intruding and imposing. To take into account this naturalistic imposition of tesserae we shall distinguish between the transitional behavior and meta-behavior. In our distinction we shall diverge from Barker's analysis by considering a preceding act as a cue which plays a role in eliciting the subsequent responses.

In adult-dominated children's groups, the role of the adult includes some features of the experimental investigator's role. In a classroom the teacher tends to be not only a participant and contributor to the stream of behavior units, but also tends to serve as an overseer who induces modifications and changes in the scene. To use Barker's terms, the teacher acts as a transducer of behavioral data in the classroom. Thus, the teacher is not only in the classroom but also is "above" the classroom regarding the behavior transacted in it. When the teacher behaves as though she was overseeing what is going on in the classroom we shall say that she is engaged in meta-behavior. In fact to generalize upon this notion of meta-behavior we shall say that any time anyone in the classroom, teachers and pupils alike, steps out of the behavioral stream to either modify the direction of the stream or to comment upon it, that person is engaged in meta-behavior.

Meta-behavior is any unit in the stream of behavior which either imposes upon the stream either a new direction, calls the stream to a halt, or interrupts the stream. Within meta-behavior we shall distinguish between deterministic and evaluative acts. Deterministic acts are those which give direction to the actions of other persons and is usually revealed by the grammatical form of the imperative mood. Stopping two boys from fighting by putting one's hands on their shoulders and holding them apart is an example of deterministic behavior. Also telling them to sit quietly is an example. Deterministic behavior can occur both at the overt motor level and at the verbal level. It may halt an episode of behavior or it may initiate one.

Evaluative meta-behavior is any unit in the stream which can be interpreted as bearing a comment upon action that has already transpired. Telling a child that he has done well or that he has done poorly are examples of positive and negative evaluative behavior respectively. Evaluative behavior bears some resemblance to social reinforcers, although we shall not at this point construe them in that light.

Transitional behavior is any unit in the behavior stream which is neither deterministic nor evaluative. Although it would be possible to develop a rather extensive classification of transitional behavior, we shall pay attention to only two attributes of this kind of behavior. Like meta-behavior, transitional behavior may be verbal or motor acts. This distinction is relatively clear and straightforward and is easy to operationalize. In addition, we shall distinguish between obtrusive and unobtrusive transitional behavior. This distinction refers to the perceptual salience of the acts that are performed. Obtrusive behavior is one which will tend by virtue of the intensity of the act itself to dominate the perceptual field. Talking loudly, or running around the room, or butting into other people's conversations are examples of obtrusive behavior. Such kinds of acts tend to force themselves upon our attention to a greater degree than such unobtrusive acts as talking quietly, or sitting at one's desk, or writing a story without any sort of commotion.

In the immediately preceding paragraphs a number of behavioral distinctions have been made and these are outlined in Illustration 2. As will be noted there are twelve distinct types or classes of acts that we shall be concerned with in this model. Examples of each of these twelve are given in the right-hand column of the illustration. All deterministic and evaluating behavior is assumed to be obtrusive. Eight of these classifications are relatively straightforward, both descriptively and in terms of their implications. Four of the classes have been starred, Nos. 6, 8, 10, and 12. While it is not difficult to find examples of these four classes, there is some possible confusion about the consequences of these four upon other persons' behavior. For example restraining a person may well also communicate negative evaluation just as telling a person that he is wrong or incorrect has some restraining connotation to it. Hence in the discussion of the implication of these various classes of behavior for subsequent behavior we will find it necessary to pool together classes 6, 8, 10, and 12.

The stream of behavior units within the classroom can be recorded as a sequence of these twelve classes of behavior, identifying which person in the group performed the act. Selected features of this record will be observed by all members of the classroom setting. As indicated earlier, we shall assume that the processes by which information from the present situation is taken in and stored in memory are veridical and constant over any population that we are studying. Hence we can assume a common memory record of overt events that take place in the classroom. This memory will include two types of information. First we can think

ILLUSTRATION II

Classification	Example
I. TRANSITIONAL	
A. Motor	
1. Obtrusive	Running around the room
2. Unobtrusive	Writing at one's desk
B. Verbal	
3. Obtrusive	Talking loudly
4. Unobtrusive	Talking quietly
II. DETERMINISTIC (obtrusive)	
A. Motor	
5. Initiating	Pushing a person into the center of the group
*6. Halting	Restraining a person
B. Verbal	
7. Initiating	"Do . . . (something)"
*8. Halting	"Stop it"
III. EVALUATING (obtrusive)	
A. Motor	
9. Positive	Patting a child's head
*10. Negative	Slapping a child
B. Verbal	
11. Positive	Saying "good"
*12. Negative	Saying "incorrect"

of a rather temporary memory in which immediately past discreet acts are recorded. The memory records will also include a rather permanent storage but in a contingency form, in which two-unit sequences are recorded for each actor in the situation. The kind of information that will be available to all persons in the classroom will be of the following sort: Given an antecedent act by anyone, what is the probability that a given person will respond with each of the available alternative acts open to him. While it would be reasonable to assume that even kindergarten children can retain more than two-step behavioral information, it is not feasible within the confines of this small model to incorporate more complicated sequences of acts. With the twelve types of behavior we have listed in Illustration I there will be 144 possible two-step sequences. This then must be multiplied by the square of the number of persons within the group to ascertain the number of bits of information with which each person must deal.

A Norm Learning Model: Preferences and Choice

We shall begin with the assumption that in any given situation a person will choose to engage in that activity which is a member of the set of possible alternative activities, which he judges himself sufficiently competent to perform in that situation, and which maximizes utilities for him. A possible alternative is one which the person is capable of executing and one which is appropriate in the situation. We use the word "appropriate" here to indicate that some acts will necessarily or reasonably follow other acts, whereas others cannot. (The notion of "appropriateness" is very similar to that of "autochthonous" as used by the students of perception.) "Competence" refers to a subjective rating of one's ability to perform a given act. Thus, possible acts are those which are objectively possible to the person whereas competence refers to the subjective rating of one's ability to perform. The notion of competence will be developed more fully later in the paper.

In order to simplify the problem of inferring preferences, we shall say that utility is a subjectively assigned property of behavior. Some behaviors can be construed as being characterized by a positive and others by a negative utility. This is equivalent to saying that some behaviors are positive goal activities and others are negative goal activities. An activity which realizes a positive utility is any consumatory action the occurrence of which increases the likelihood that it will occur again; in other words, the occurrence of an activity increases the organism's preference for it. (Notice that this conception of satiation and preference is closely allied to the notion of reinforder and reinforcement.) This relationship leads to a preference-occurrence circuit: that activity which is preferred over others will be chosen, and the occurrence of that act increases its preference over others. There are, however, limitations upon this statement such that the preference-occurrence circuit is not a closed system. In part this derives from the intrusion of extra-organismic events and in part from cyclic or periodic variations in the intra-organic states of the individual which are unrelated to the preference hierarchy at the given moment. Thus, we may think of the organism being characterized by a number of conditional hierarchies, such as conditions of fatigue, of stimulus deprivation, or of over-stimulated states.

For the moment we shall be less concerned with the intra-individual sources of preference-hierarchy variability than with the sources outside of the organism. To simplify matters we shall make some assumption about the constancy of organismic drives. There will be an emphasis upon what has been called secondary needs. The demands of others, the utility of their action, and the resources in the environment serve as limitations upon the preference-occurrence loop. We shall ignore the role of resources to a large degree and focus mainly upon both the demands others place upon the individual and the utility of the actions of others for that individual.

Implicit in the primitive notion of demand is the control of utility. One individual can demand some action of another to the degree that the first person can, that is he is able to, perform some act which increases or decreases utilities (satiation) for the second. The notion of threat of punishment and promise of reward clearly suggest this. Two effects of making demands are of interest to us here. First, having demands made upon a person requires that person to adjudicate between his own preferences and the demand in his choice of actions to be performed. The person will choose that action which maximizes the utilities. A number of specific propositions about decision rules can be listed given the conditions of a demanding other: (1) that act which is demanded by another and which leads to positive utilities will increase in conditional preference; (2) inversely that act which is demanded by another and leads to negative utility will decrease in conditional preference.

A corollary to the above is the effect of demand-making upon the demander himself. Demanding is itself an action. It is an instrumental act which potentially manipulates the actions of others. These latter actions are either satiating to the demander or facilitate his satiation. Under conditions of a responding other, the act of demanding a particular act of another will increase in preference for the demander to the extent that the responder performs that act and positive utilities follow. *Successfully demanding a given action of another increases the preference for demanding that action and unsuccessful demanding decreases that preference.*

Whenever a responding person engages in an action demanded by another, the consequence is a positive utility for the demanding person, and the consequence is a negative utility if the responder does not engage in it. The objective manipulations of utilities for another is called *sanctioning*. In general, any act by one person which follows the act of another is potentially sanctioning. *A "following" act is a positive sanction of the preceding act if it meets one of the following criteria:* (1) *the act itself is satiating to the performer of the preceding act*; or (2) *if it permits the performer of the preceding act to perform another act which is satiating. A "following" act is a negative sanction if* (1) *it prohibits the performer of the preceding act to perform a satiating act*, or (2) *it necessarily leads to an act which the performer of the preceding act rejects or avoids* (i. e., actively does not prefer).

Preferences and sanctions interact in choosing actions to be performed. An act will be chosen which maximizes both the degree and likelihood of "satiation." Begin by considering a set of discreet acts, [A, B, C, . . ., N.]. From this set of acts, sequences of one or more acts can be constructed such that the expected transitional probabilities between any preceding and following act including the terminal act in the sequence approaches 1.0; but the expected probabilities of acts which temporally could follow the terminal act approach equal probability when only the terminal act itself is given. Thus, these strings or sequences of acts are similar to Roger Barker's episodes (without nesting). We might also view them as motivationally or functionally meaningful units of behavior. Whatever the construction we place upon them, our main concern here is to note that the occurrence of the terminal act implies satiation of the sequence as a whole. It is the occurrence of the terminal act, given the occurrence of the preceding one, which has utility. For the purposes of our systematic analysis we shall arbitrarily construct sequences of one or more acts, endowing the terminal acts with utility or satiation.

Now return to our discussion of preferences. We have envisioned acts as being more or less equally preferred. Now we shall enlarge our notion of acts to include sequences of one or more acts. Given this new view of acts we can construe transacted behavior within a classroom situation as a multi-person game. In this game each individual is attempting to control the stream of events such that he is permitted to engage in a satiating act. He does this by selecting a sequence of his own behaviors which represent a string whose terminal act is satiating, or by selecting acts which induce or increase the probability that other individuals will perform acts which are satiating or lead to satiating acts for that person.

The regular reinforcement of a particular response following a particular stimulus may induce a patternness or orderliness in behavior, at least of that particular response. In the case of a 100 per cent schedule of reinforcement the response will occur so long as the reinforcement is certain. Within the context of human interaction, in particular the classroom, the omnipresence of the teacher and her readiness to sanction is a perfectly good illustration. Generalizing this notion, we can state a proposition about the acquisition of preferences. Within a standard range of situational cues, the probability that a person will select (prefer over others) a particular response varies directly with the probability that it will maximize positive utilities for that person.

Implicit in the above proposition is the assumption that behavioral preferences are logically tied to the utilities or consequences which follow from the various behavioral alternatives. Our use of the utilities concept suggests the possibility that the syllogism could also be construed as a formal decision model such as the subjectively-expected-utility model. Actually a syllogism is a decision model. Of greater importance than the possibility of a formal decision model being employed are social implications of this first proposition. Clearly the responding individual is not interacting with another, the potentially sanctioning other, but is rather reacting to a set of environmental events which happen to include other human beings some of whom have limiting if not coercive power. The others may be seen as potential manipulators of the responding person, and each person responds in like mode. There is little meaning to the concept of preference consensus within the above proposition. There may be some correspondence between the sanctioner's preferences and the responder's preferences but this is only casual, incidental, and fortuitous. Aside from the more cognitive elements of the premises of the norm syllogism which have some possibility of being learned, the connative side of norm learning must be investigated from the standpoint of primary and secondary drives, needs, or motives. The person's hierarchy of preferences is not independent of interests and actions of other individuals, but is independent of any identification with them however one may wish to construe identification. In Martin Buber's terms, within the above proposition, the other it still "it."

A Norm Learning Model; Persons and Acts as Bases of Choice

We shall assume that within a person's permanent memory of events, which have occurred in a particular type of interacting setting, is stored more information than the individual can possibly use in calculating his choice of response to the immediately preceding stimulus. Consequently, it will be necessary to provide each of our hypothetical actors with a basis for selecting out certain classes of information for consideration and eliminating the remainder. Within the present scheme we will allow each actor to make his choice upon one of two bases. He may choose to give primary weight to information which he has about the acts themselves or he may choose on the basis of information that he has about other actors in the situation. We might speak of these two bases as reflecting two different orientations to the immediate situation.

For the individual who gives attention to the acts, primary emphasis is placed upon the utilities derived from those acts. It will tend to reflect a degree of social independence as opposed to the orientation of that individual who places greater weight upon information about other people. The latter orientation suggests an affiliative tendency within the person, the utilities of the responses emanating from others being of greater moment than the utilities associated with his own responses. Another way of describing this distinction is to suggest that the act-oriented person is more concerned with intrinsic gratification whereas the other-oriented person is more concerned with extrinsic gratification.

Before examining this distinction further, it would be wise to describe the parameters of what we have called permanent memory and also the parameters of acts and persons.

In the permanent memory of our model norm-learner is stored information which answers the following questions. If the norm learner chooses a particular alternative act a who is likely to do what? Given a, what is the likelihood that individual i will respond with act x? We shall define permanent memory as a three dimensional array, the entries of which are the conditional probabilities Pr(i,x|a). We assume it is an accurate, veridical record of all two-act contingencies in which the actor of the second act is identified. This information in main memory is permanent to all actors and equally accessible to all actors.

We shall posit three interpersonally relevant characteristics of actors in the situation which enter into the decision model as parameters. The three characteristics are: liking, power, and response rate. Within this model individuals will not only be allowed to choose acts but they will be permitted to direct their acts toward other actors. One individual i likes another individual j to the extent that individual j has directed acts of non-negative utilities toward individual i. Interpreted loosely, this means that one individual will like the other to the extent that the other directs acts toward him and these acts have not been threatening to the individual.

Power can be defined as a potency of one individual to control another person's opportunity to be rewarded. We shall not treat power as an imputed or a defined characteristic of the individual but rather shall allow power to vary from one moment to the next and hence power is a rule within this model. The rule is based upon David Premack's generalization that, "A reward is simply any response that is independently more probable than another response." (1962) It is interesting to note the close resemblance between Premack's definition of reward or reinforcer on the one hand and the concept of information on the other. A reward is an act which is more informational than another act. Within our scheme we shall say that a person i is more powerful than person j if person i has a greater probability of engaging in very likely and very unlikely acts. Since reward is predicated upon the relative frequencies of the antecedents of the consequent act, person i would be in a position to choose whether or not he will perform an act which has a higher or a lower probability than the antecedent act of another person j. In sum, power is the ability to choose to reward or not to reward.

Response rate refers to the relative frequency with which an individual has behaved or acted in the past. We proceed on the assumption that the probability that a person will act is some function of the relative frequency with which the individual has acted in the past.

We shall also posit three traits of the individual actor which might be interpreted in motivational and cognitive terms. Two of these are preference or utility traits and correspond to the motivational or need component of individual personalities. The third variable is the individual's own rating of his competence to perform each of the possible acts. With respect to utilities we shall distinguish between intrinsic utility, which is derived from engaging in a particular act, and extrinsic utility, which is an attribute of an antecedent act. The source of basis of these utilities will be left undefined, hence we are treating utilities as primitive terms at the outset of our interacting situation. However, we shall also provide later rules by which these utilities change. The individual's subjective ratings of his competence to perform each of the types of acts will be assumed to be a function of the evaluative responses that the individual receives from others in the interacting situation.

In Illustration III we have indicated all of the parameters that will be taken into account in the decision whether to respond primarily to acts or to individuals. It is proposed that an individual will choose to consider acts if he feels competent and can reasonably expect utilities, but he will choose to consider individuals if individuals are seen as powerful, well-liked, and active. In any given situation he will have to choose to focus upon one or the other, and the rule for choosing is as

ILLUSTRATION III

$$U_s(a) = \sum_{i = 1,\, n}\ \sum_{x = 1,\, z}(f_i(x\ a) \quad p_i(x)L(i)R(i)) \qquad C(a)p_s(a)$$

Variable	Increment	Definition
$f_i(x/a)$	I	the frequency of _i_ doing _x_ following _a_
$p_s(a)$	ψ	_s_'s preference (utility) associated with _s_ doing _a_
$p_i(a)$	δ	_s_'s preference (utility) associated with _i_ doing _a_
L(i)	ϕ	_s_'s liking for or attraction to _i_
p(i)	α	_s_'s attribution of power to _i_
R(i)	β	_i_'s response rate
$C_s(a)$	κ	_s_'s self-rated competence to do _a_

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follows: The individual will stochastically choose to consider acts (as opposed to considering persons) as the basis for his behavioral choice in the next moment if there is more information in the distribution of act-related parameters as compared with the information in the other-person-related parameters. This can be written in the following form:

$$A = \frac{\sum_{a=1}^{e} q_a \, \mathrm{Log}_x a}{\left(-\sum_{a=1}^{e} q_a \, \mathrm{Log}_x q_a / \mathrm{Log}_x a\right) + \left(-\sum_{i=1}^{n} r_i \, \mathrm{Log}_x r_i / \mathrm{Log}_x i\right)}$$

where:

$$q_a = \frac{[C_s(a) \; p_s(a)]^{\beta}}{\sum_{a=1}^{e} [C_s(a) \; p_s(a)]^{\beta}}$$

and,

$$r_i = \frac{[I(i) \; L(i) \; R(i)]^{\phi}}{\sum_{i=1}^{n} [I(i) \; L(i) \; R(i)]^{\phi}}$$

$C_s(a)$ = person s's self-rated competence to do a

$p_s(a)$ = the utility value for s associated with s doing a

I(i) = person i's power to control rewards for s

L(i) = person s's liking for i

R(i) = person i's probability of responding

s } are both exponents which are ordinarily set to 1, but can be increased or decreased so as to make orientation to acts and persons, respectively, greater or less likely. This is tantamount to giving the individual s a "tendency" to be act or person oriented.

ϕ_s }

The value A is a ratio of the amount of information in the distribution of intrinsically derived information (utilities and competence) to the total amount of information derived from both intrinsic and extrinsic sources (power, liking and response rate). The value A is used in the rule for choosing between consideration of acts and persons as stochastic parameters. If the value of A is .6, the probability of orienting toward acts is .6 and the probability of orienting toward persons is .4.

The rationale underlying the use of A as a stochastic parameter lies in the intuitive notion that an individual will choose to consider those discriminable elements which provide him with the greatest information, and hence the greatest chance of maximizing utilities. This will become apparent as we proceed and see the role of the extrinsic factors in determining the amount of reward or satisfaction that an individual derives from a particular choice of act. The consequence of orienting to either acts or persons is to reduce the amount of information that the individual will consider in selecting an act. If a person orients to acts then he will eliminate from consideration those acts which either have the possibility of a low utility field or acts for which he does not rate himself as competent. If the individual orients toward persons, then he has an additional decision to make. That decision is this: Shall he focus upon the personal attraction to others, that is his liking for others, or shall he focus upon their power, that is their ability to control reward.

Behavioral choices within an act-orientation are based primarily upon utilities associated with a person's own performance and upon his competence to perform those acts, qualified by what we shall call a recency-density function. The product of these three values for each act we shall call the expected utility of that act, and can be defined as follows:

$$U_s(a) = p_s(a) \Delta (a)$$

where: $p_s(a)$ is the utility associated with *s*'s performance of *a*

$C_s(a)$ is person *s*'s self-rated competence to perform *a*

$\Delta(a)$ the recency-density function is defined as follows:

$$\Delta(a) = \sqrt{\sum_{t = 1,\ n} \frac{\mathrm{Lim}-t_a(n)}{\mathrm{Lim}}}$$

where: $t_a(n)$ is the interval between $t = 0$ and the point $t = n$ at which act *a* occurred

L is the limit of recency, that is, the range of past events *t* that are considered

The recency-density function will reduce the expected utility of a given act as a function of the recency of the function and the frequency of that function within recent acts defined by the limit L. Having computed the expected utility for each of the *n* possible acts, the person would then consider only a few of these possible acts, for example three or four. The expected utilities for those few acts that are considered would be summed and each expected utility value would be divided by that sum. This value would then be used as a stochastic parameter for choosing among the acts.

Given the person-orientation toward behavioral choice there are two bases for making such choices. One basis is the actor's attraction to other persons in the setting, and the second focuses upon the relative power of other actors to control reward-non-reward for the actor. Both of these focus upon the rewarding process, however, the two are quite distinct in terms of the role the actor plays in the rewarding process. If liking or attraction to others is the basis for behavioral choice, then then the individual is concerned with behaving in such a way as to make it possible for others to select acts for themselves which are self-rewarding. We can formalize this relationship as follows: If the actor, s, likes i, some other individual, and i has recently directed an act toward s, then s will select an act which has a high probability of occurring, and thus potentially increasing individual i's utility, $p_o(a)$. In a sense liking another person means that one will attempt to increment the utilities of others.

The notion of power within the present model suggests quite the opposite orientation toward interpersonal relations. A powerful person is one who is potentially rewarding to the actor. The powerful person can purvey extrinsic rewards. If behavioral choices are predicated upon the power factor, then the individual will select a low probability act which has then a high likelihood of being followed by a high probability act by another. In formal terms this relationship can be stated as follows: If i, some other individual, is powerful, and i has not recently performed any high probability act, then s, the actor, will choose a low probability act and direct it toward i. Whereas liking as the basis for behavioral choice will tend to increase the probability that an actor will choose an act which is extrinsically rewarding to another, power as the basis of behavioral choice will tend to increase the probability that an individual will act so as to increase his own intrinsic reward possibilities. How does the individual decide whether to use liking or power as a basis for making behavioral choices? We shall consider liking and power ratings as continuous values. For each other individual in the setting two scores will be computed as follows:

$$L'(i) = L(i)\, r(i)$$

$$F'(i) = \sum_{a = 1,\, x} (1 - (f_i(a) / \Sigma f(i))\, r_i(a))$$

where: L(i) is s's liking for i

$$r(i) = \sum_{t = 1,\, n} \left(\frac{L - t_i(n)}{L} \right)$$

$\Sigma f_i(a)$ is the frequency of i's performance of a

f(i) is the total frequency of i's performances

$$r_i(a) = \sum_{t = 1,\, n} \left(\frac{L - t_{1,\, a}(n)}{L} \right)$$

The L' and F' values will be converted to relative values by dividing each by the sum total of all L' or of all F' scores for persons in the setting. A procedure similar to that used in computing A above will be used in computing the relative amount of information available in the L' and F' distributions. That distribution which contains the greatest amount of information will be used as the basis for behavioral choice. Within the chosen distribution the two persons whose relative values are the highest will be considered as persons to whom action will be directed. That action will be chosen which s has performed least frequently or most frequently depending upon whether the selected basis is power or liking, respectively.

The next issue to consider is what happens once an individual has selected a behavioral alternative. First, we must consider that all individuals in the setting are making such choices at each time point. Which individual will actually get an opportunity to perform his chosen alternative is a stochastic function of the response rate of each individual. The response rates of the individuals will be converted into relative scores and these will be used as stochastic parameters in choosing among them. Obviously the person whose relative response rate is the highest will have the greatest probability of being the actor at that time point. In converting response rates to relative terms there will be a function applied to them which reduces the possibility of the relative response rates exceeding some given proportion, probably in the range of .5 or .6. This notion is predicated upon the common observation that in relatively small groups the frequency with which the next most frequent, who in turn performs twice as often as the next most. For groups of relatively small size the rate of performance of the most frequent performer is approximately 55 per cent of the total group performance.

After the actor has been selected on this probability basis, the question is what are the consequences of a particular actor being selected to perform a given behavioral alternative. The answer to this question is complex. The incrementing rules are listed in Illustration IV. First, we will increase both the tally of his responses which we use in computing his response rate, and also the frequency with which he performs a particular act taking into account the antecedent acts recorded in temporary memory. Because his power rating is predicated upon the frequency with which he performs given types of acts, his power rating is automatically altered by this tallying procedure. Next, the intrinsic utility associated with his own performance will be incremented as a function of the level of his pre-act utility for that given act. His act will also alter the other actor's liking for him, the extrinsic utilities of others associated with the act just performed, and to the extent that the other individual emitted an evaluative act, the other person's competence ratings will also be modified. The manner in which each of these variables is changed for i by i's performance of an act a which followed a preceding act x is given in the following algorithms:

1. Response Rate

$$\underset{t=1}{R(i)} = \underset{t=0}{R(a)+1}$$

2. Response frequencies by type of act

$$\underset{t=1}{f_i(a)} = \underset{t=0}{f_i(a)+1}$$

3. Conditional frequency of a by i given x

$$f_i(a|x) = f_i(a_i|x_j)+1$$

4. Utility of a for i, the actor

$$\underset{t=1}{P_i(a)} = \underset{t=0}{P_i(a)+1/P_i(a)}$$

5. Utility of a for j

$$\underset{t=1}{P_j(a)} = \overline{\underset{t=0}{f(a_i|x_j)}/\underset{t<0}{f(x_j|y_k)}} \quad \underset{t=0}{p_j(a)} \quad r_i(x)$$

6. j's liking for i

$$\underset{t=1}{L_j(i)} = \overline{\underset{t=0}{f(a_i|x_j)}/\underset{t<0}{f(x_j|y_k)}} \quad r_i(x) \quad + \quad \underset{t=0}{L_j(i)}$$

7. Self-rated competence

a. $\underset{t=1}{C_j(x)} = \underset{t=0}{C_j(x)} + z$, if $\underset{t=0}{a_i}$ was positive evaluation

b. $\underset{t=1}{C_j(x)} = \underset{t=0}{C_j(x)} - z$, if $\underset{t=0}{a_i}$ was negative evaluation

where:		
	i	is the actor
	j	is the other person
	t=0	is act time
	t=1	is time point following act time
	t<0	is recent time points, limited by Lim
	z	is a constant

Calculating the effects of the act a by individual i upon both permanent memory as well as the parameters of the individual actors, sets up the situation in which the next behavioral choice is made. The stream of behavior in the simulated classroom then is a succession of procedures of making a choice followed by computing the effects of that choice, followed by the next choice and so on.

ILLUSTRATION IV

Variable	Increment Rule:
$p_s(a)$	increment by ψ each time s does a at t=1, and is not followed by a negative evaluation at t=2. ψ is a lognormal function of $p_s(a)$.
$p_i(a)$	increment by δ each time i does a at t=z following s's act at t=1. δ is a lognormal function of $p_i(a)$.
L(i)	increment by ϕ each time i acts. ϕ is a lognormal function of $p_i(a)$, where a is the act i does.
P(i)	increment by α each time i does x at t=1, where x is a deterministic act, and at t=2 s's act conforms to x. α is a lognormal function of P(i).
R(i)	increment by β each time i acts. β is a lognormal function of R(i).
C(a)	increment by κ each time s's act at t=1, is followed by an evaluative act at t=2, by some i. κ is a lognormal function of the product of P(i) and the utility s association with $P_i(e)$, where e is the evaluative act.

The increment to $C_s(a)$ generalizes to all other $C_s(x)$ inversely as a function of the difference between $p_s(a)$ and $p_s(x)$, where a is the act followed by evaluation.

The Role of the Teacher

Up to this point all actors in the situation have been considered equal in terms of their potential responses as well as the class of decisions which they can make. Obviously an important distinction in any classroom is the differential in maturity between pupils and teacher. It would be reasonable to assume that she can consider a greater number of bits of information in making decisions about her own behavior and furthermore, by virtue of the authority invested in her role, the teacher could be expected to emit a higher proportion of so-called meta-behaviors than the pupils. In order to accommodate these differences between teacher and pupil we shall, in the simulated model developed here, endow the teacher with two attributes which pupils do not have. First, before any pupil is allowed to enact his behavioral choice, the teacher will be given the opportunity to decide whether or not she chooses to act at that time. The teacher's decision to preempt action at a particular time is predicated upon the second special quality which we shall assign to the teacher. This feature of the teacher role is the process of evaluating the goodness or quality of the recent events in the classroom. Thus, the teacher at any given time can review the behavior within temporary memory, that is acts that have recently occurred, and decide to emit an evaluative or deterministic response. This decision to select a meta-behavior alternative and preempt action at any given time can be thought of as traits or strategies which are characteristic of the teacher. For example, it is possible to find a teacher who in effect rewards on a given schedule which may be fixed or ratio. While it would be reasonable to assume that pupils may also emit meta-behaviors, we shall keep our model simple by not permitting pupils to behave in this way. Given these special qualities teachers can interrupt the stream of behavioral units within the classroom.

We have already indicated the consequences of evaluative acts for the pupils' ratings of their own competence to perform given acts, but we have not yet indicated the implications of the deterministic response. Whether or not a pupil obeys a command, that is a deterministic response from the teacher, will depend upon three factors. These are the relative liking of the teacher as compared with liking for his fellow pupils, the relative power of the teacher as compared with the power of the classroom peers, and the recency with which the deterministic response was emitted. The correspondence between pupil behavior in the recent past and the teacher's preferences for pupils' behavior serves as a primary basis for deciding to emit a meta-behavior. This intuitively corresponds to the teacher's desire for the pupils to behave in a manner which she prefers.

By the use of meta-behaviors the teacher communicates to the children in her class her preferences for their behavior. By communicating her preferences to children she provides them with information which they need to take into account when calculating their behavioral decisions. We can say that children have learned classroom norms to the extent that they have effectively learned to take into account teacher's preferences for their behavior.

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